Appeal Nos. 2015-1125, -1126, -1127

United States Court of Appeals for the Federal Circuit

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, and DOMAINE ASSOCIATES, LLC,
Plaintiffs-Appellants,
v.
ASUS COMPUTER INTERNATIONAL and ASUSTEK COMPUTER INC.,
Defendants-Appellees,
AND
TPV TECHNOLOGY LIMITED, TOP VICTORY INTERNATIONAL LIMITED, TOP VICTORY ELECTRONICS (FUJIAN) CO. LTD., TOP VICTORY ELECTRONICS (TAIWAN) CO., LTD., TPV ELECTRONICS (FUJIAN) CO. LTD., TPV INTERNATIONAL (USA), INC., ENVISION PERIPHERALS, INC.,
Defendants-Appellees,
AND
ACER, INC. AND **ACER AMERICA CORPORATION,**
Defendants-Appellees.

Appeal from the United States District Court for the Southern District of Florida, Case No. 09-12-CV-80694, -80697, -80701 - Judge Seitz

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OPENING BRIEF FOR PLAINTIFF-APPELLANT

January 13, 2015

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UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

Nos. 2015-1125, -1126, -1127

Certificate of Interest

Counsel for Plaintiff-Appellant Florida Atlantic University Research Corporation and Domaine Associates, LLC certify the following:

1. The full name of every party or amicus represented by me is:

Florida Atlantic Research Corporation and Domaine Associates, LLC

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

N/A

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of the party or amicus curiae represented by me are:

N/A

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:
Attorneys who appeared in the trial court: Hunton & Williams LLP, Gregory N. Stillman, Michael O'Shea, Ozzie Farres, Laurie Mathews, Michelle Della Guardia, Wendy C. McGraw, Barry Davidson
Attorneys expected to appear in this Court: Hunton & Williams LLP, Gregory N. Stillman, Ozzie Farres, Michael O'Shea

January 13, 2015

/s/ Gregory N. Stillman
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'385 Patent:	U.S. Patent No. 5,349,385, entitled "Adaptive Scan Converter"
FAU:	Plaintiffs-Appellants Florida Atlantic University Research Corporation and Domaine Associates, LLC
Flat Screen Sellers:	Defendants-Appellees ACER, ASUS, and TPV
ACER:	Acer, Inc. and Acer America Corporation
ASUS:	ASUS Computer International and ASUSTek Computer Inc.
TPV:	TPV Technology Limited , Top Victory International Limited, Top Victory Electronics (Fujian) Co., Ltd., Top Victory Electronics (Taiwan) Co., Ltd., TPV Electronics (Fujian) Co. Ltd., TPV International (USA), Inc., Envision Peripherals, Inc.

STATEMENT OF RELATED CASES

This is the first appeal in this case, and there are no other matters pending in the trial court or any appellate court related to the subject patent.

JURISDICTIONAL STATEMENT

The trial court had jurisdiction over this action for patent infringement under 28 U.S.C. §§ 1331 and 1338(a). On June 25, 2014, the trial court entered a final judgment and order granting summary judgment to the Flat Screen Sellers — TPV, ACER, and ASUS — and holding that the patent-in-suit is indefinite. The plaintiffs, Florida Atlantic University Research Corporation and Domaine Associates, LLC (collectively, "FAU"), filed a Motion for Reconsideration, which was denied by the trial court on October 3, 2014. FAU filed a timely notice of appeal, over which this Court has appellate jurisdiction under 28 U.S.C. § 1295(a)(1).

INTRODUCTION

U.S. Patent No. 5,349,385, aptly entitled "Adaptive Scan Converter" (the "'385 patent"), discloses an apparatus that assures that an incoming video signal sent to a flat screen monitor will be able to be fully presented on the monitor. If there are a different number of horizontal lines in the frame of the signal than there

are in the flat screen matrix of pixels, then the signal is "scan converted" to be fully presented on the screen.

The inventor, Dr. William Glenn, was a pioneer in video signal technology. A named inventor in more than 130 patents, Dr. Glenn was awarded an Emmy by the National Academy of Television Arts and Sciences in 1978. In the late 1980s, Business Week acknowledged Dr. Glenn as one of the top ten scientists in the United States. There can be no doubt that he was a person of extraordinary skill in the art of video technology.

Prior to Dr. Glenn's invention, scan converters stored an entire frame of incoming video in a frame buffer, and the stored framed would then be scan converted to generate an output frame to fit the parameters of the display. The storing of an entire frame of video led to measurable delay or lag between the input video signal and the scan converted output signal and also led to quality degradation issues. Dr. Glenn overcame these problems by storing only a few lines of an incoming video signal (using line buffers) and commencing scan conversion more quickly. As the trial court recognized, "[w]hile scan conversion technology has been in existence since the 1960s, the '385 Patent's novelty comes from its

ability to perform the conversion without storing an entire frame of information as required by the prior art." (Order at 3, A19).

This appeal concerns the trial court's decision invalidating the '385 Patent for indefiniteness. The trial court held that the '385 Patent "does not clearly link corresponding structure to the 'means for recognizing the number of lines in said [input/first] format'" as recited in Claims 1 and 2.[1] (Order at 2, A18). This decision was in error.

Figure 1 of the Patent includes the following:

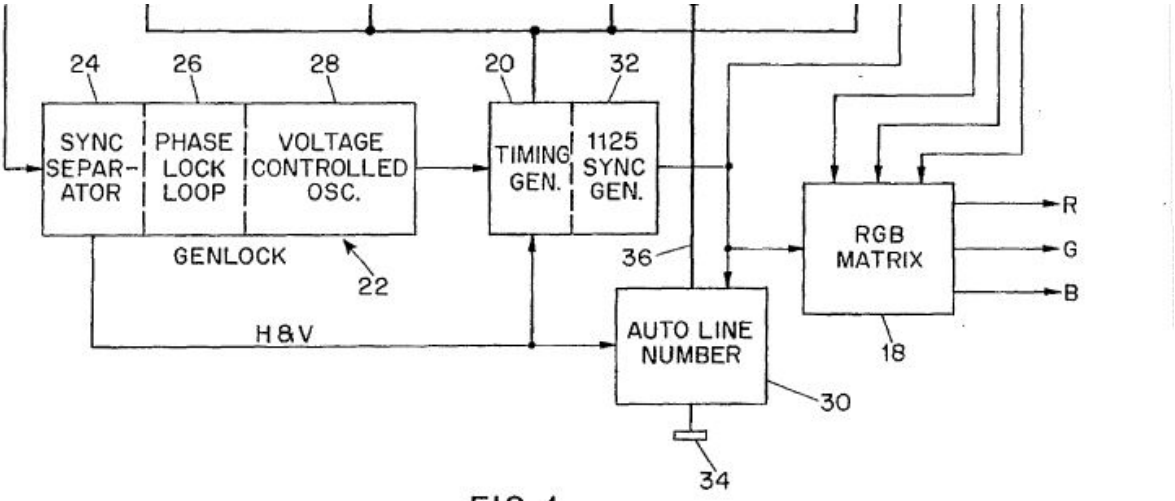

FIG. 1

[1] Claims 1 and 2 recite "recognizing the number of lines in said input format" and Claims 6 and 7 recite "recognizing the number of lines in said first format."

The technical experts for both sides agreed that the "H&V" item in Figure 1 informs the person of ordinary skill in the art that Auto Line Number 30 includes a counter that performs the "recognizing" function. Specifically, the technical experts, as persons of ordinary skill in the art, understand that the H refers to a horizontal sync signal and the V refers to a vertical sync signal. The H sync signal indicates the number of lines. That is, each H sync signal provides indication of a line in a single frame. The V sync signal indicates that the frame is complete and a new frame begins. These sync signals are received and counted in the Auto Line Number 30. Therefore, a counter that increments on each H sync and rests on a V sync in Auto Line Number 30 is the corresponding structure in the specification that "recognizes the number of lines in said input/first format." Where, as here, both technical experts agree that the structure disclosed to perform the function is a counter, there can be little doubt that the claim is definite.

Rather than follow the only two technical experts in the case on this point, the trial court instead focused on evidence that is unrelated to the proper interpretation of the "means for recognizing" element. Such unrelated evidence includes an expert *infringement* report relating to equivalents of the counter, *Markman* testimony on *infringement* relating to equivalents of the counter, as well

as deposition testimony from other witnesses. The fact that there may be equivalent structures that can perform the "recognizing" function does not change the fact that Figure 1 of the patent discloses a counter as the corresponding structure to perform this function.

Under the proper interpretation, "means for recognizing the number of lines in said input/first format" is a counter. Applying the relevant evidence, Claims 1 and 2 of the '385 patent are definite and the trial court's order must be reversed.

STATEMENT OF THE ISSUES

FAU's appeal presents the following issues:

1. Whether the trial court erred in invalidating a means-plus-function claim term as indefinite, where both technical experts agreed that the patent specification discloses to a person of ordinary skill in the art structure that counts the H sync signals and resets on each V sync signal to perform the function of "recognizing the number of lines in said input/first format."

2. Whether the trial court erred in granting summary judgment on indefiniteness — rather than reserving the issue for a full evidentiary hearing — where the Flat Screen Sellers failed to prove the facts underlying the indefiniteness inquiry by clear and convincing evidence.

STATEMENT OF THE CASE

A. The Problem Solved by Dr. Glenn

The '385 Patent is aptly entitled "Adaptive Scan Converter." (Patent at Front Page, A97). Filed in August of 1992, the patent issued in September of 1994, disclosing an apparatus that improves video display technology on flat matrix monitors or so-called "flat screens." (Patent at 1, A101; *see also* Validity Report at 18, A841).

In 1992, virtually all video was displayed on traditional displays using cathode ray tubes, *i.e.*, CRT displays. (Validity Report at 21, A844; Patent at 1:9-11, A101). Understanding that the future would move to flat screen technology, Dr. Glenn sought to improve upon the existing technology used to convert the incoming video signal to fill up the entire screen. (Validity Report at 23, A846).

An incoming video signal presents itself in lines of information. Depending upon its source, (e.g., network television such as NBC, CBS or ABC), or cable (ESPN or CNN) or a simple DVD player, the incoming video signal may present a varied number of horizontal lines, often referred to as 1080, 780, 525 480 or some variation thereof. A flat screen has a fixed matrix of horizontal lines. When the incoming video signal presents a number of lines different from the number of lines fixed by the flat matrix display manufacturer, the signal must be converted

(scan conversion) in order to fill the entire screen. (Validity Report at 21-24, A844-47; *Markman* Hearing (September 20, 2013) at 23:8-23, A256).

In 1992, the process of scan conversion was well known by those skilled in the art of video signal technology. It simply involved counting or otherwise determining the number of lines presented by the incoming video signal, then, often by interpolation, "converting" the number of lines from the incoming signal to the number of lines fixed by the manufacturer. Without scan conversion, an incoming signal of 480 lines would only partially fill a monitor screen that displayed a fixed output format of 1080 lines.[2] (*Markman* Hearing (September 20, 2013) at 23:8-23, A256).

Dr. Glenn's adaptive scan converter described in the '385 Patent converts the number of lines contained in the incoming video signal faster and with higher quality than previously possible. Dr. Glenn did this by interpolating the incoming video signal **before** the entire frame was stored, using line buffer technology. This technology had the benefit of speed, thereby reducing the lag time necessary to convert the incoming video signal. Moreover, this reduced lag time produced a

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[2] Until recently, the gold standard for high definition television was 1080 horizontal lines of resolution. Now, with the ultra-high definition flat screens may display 2160 or more horizontal lines.

higher quality picture. (*Markman* Hearing (September 20. 2013) at 27:2-28:5 and 36:8-17, A260-61 and A269; Patent – Abstract, A97; Validity Report at 18-20, A841-43).

B. Procedural History

FAU filed its complaints for patent infringement against ACER[3] and ASUS[4] on June 28, 2012. FAU filed its complaint against TPV[5] on June 29, 2012. The complaints were subsequently amended. By Orders dated January 30, 2013 and February 15, 2013, the trial court consolidated the cases for certain pre-trial activities, including discovery and claim construction.

The trial court heard two days of *Markman* testimony on September 20, 2013 and October 2, 2013. (A234-453 and A254-691). On November 8, 2013, the

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[3] ACER refers to the named defendants in Case Number 09-12-CV-80694: Acer, Inc. and Acer America Corporation

[4] ASUS refers to the named defendants in case number 09-12-CV-80697: ASUS Computer International and ASUSTek Computer Inc.

[5] TPV refers to the named defendants in case number 09-12-CV-80701: Defendants TPV Technology Limited, Top Victory International Limited, Top Victory Electronics (Fujian) Co., Ltd., Top Victory Electronics (Taiwan) Co., Ltd., TPV Electronics (Fujian) Co. Ltd., TPV International (USA), Inc., Envision Peripherals, Inc. AOC International was named as a defendant, but was never served and is not participating in this appeal.

trial court issued its *Markman* decision, which was subsequently amended on December 23, 2013. (A706-11).

On March 22, 2014, the Flat Screen Sellers filed a Combined Motion for Summary Judgment of Invalidity and Non-Infringement, in which they argued that the '385 Patent is indefinite. (A712-64). In support of their Motion for Summary Judgment, the Flat Screen Sellers cited to a few sentences from the Deposition of John W. Marcinka, a former co-worker of Dr. Glenn. FAU submitted a declaration from Mr. Marcinka to explain the cited testimony (A2504-17), but the trial court struck the declaration *in toto* as improper expert testimony. (A41-47).

On June 25, 2014, the trial court granted the Flat Screen Sellers' Motion for Summary Judgment and held that "the '385 Patent is indefinite and, therefore, invalid because it does not clearly link corresponding structure to the 'means for recognizing the number of lines in said [input/first] format.'" (Order at 2, A2). The trial court entered a final judgment on June 25, 2014. (A34). The trial court then issued an amended summary judgment order to include Appendix A, a copy of Figure 1 from the '385 Patent. (A17-33).

FAU filed a Motion for Reconsideration on July 23, 2014, which the trial court denied. (A35-40). FAU timely filed its Notice of Appeal in all three cases. (A2777-88).

C. The Record Evidence And The District Court's Ruling

The first step to the scan conversion process is an obvious one for any scan converter – not just Dr. Glenn's. Scan conversion begins by "recognizing the number of lines" contained in the incoming video signal. The trial court construed the phrase "recognizing the number of lines in said input/first format" as "automatically recognizing the number of lines in said input format without being told the vertical line number." (*Markman* Order, D.E. 151 at 14, A705).

The parties agreed that the corresponding structure to perform the function of "recognizing the number of lines" is described in the patent's specification as Auto Line Number 30. (Joint Claim Construction Statement, D.E. 85, A217-33) (*See also* Patent Figure 1, A98). The Flat Screen Sellers, however argued on summary judgment that the '385 patent was indefinite because the "specification discloses nothing more than a black box having the ambiguous name 'Auto Line Number 30.'" (D.E. 234-1 at 2, A718). FAU opposed that Motion, based principally upon Figure 1 of the Patent and the expert report and sworn declaration of its technical expert Dr. Brian Von Herzen. Dr. Von Herzen explained the Patent and its underlying technology through the eyes of one skilled in the art.

Figure 1 of the Patent includes the following:

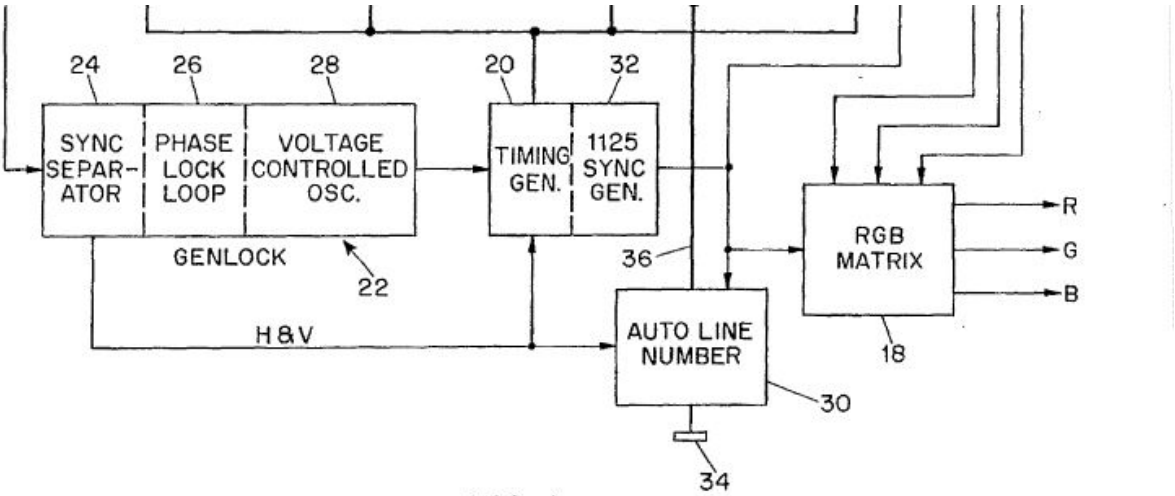

FIG. 1

Figure 1 describes the "stripping" of the H sync and V sync pulses from the incoming video signal by the sync separator. The pulses are then provided to Auto Line Number 30 so that it can "recognize[s] the number of lines" by counting the number of H syncs in between V syncs. So, for example, if there are 525 H sync pulses in between V sync pules, the apparatus understands the signal to be in 525 format. (*Markman* Hearing (September 20, 2013) at 129:15-23, A362) (testimony of Flat Screen Seller's expert).

Dr. Von Herzen's expert report established that a person or ordinary skill in the art would know that the structure disclosed to "recognize the number of lines" is a counter inside of Auto Line Number 30 that counts the number of H syncs and resets on each V sync. Dr. Von Herzen explained:

> [T]he description in the specification of the Auto Line Number circuit provides such sufficient detail when viewed through the eyes of one of ordinary skill in the art as it specifically teaches and enables one of ordinary skill in the art to understand the corresponding structure. As shown in Figure 1 of the Glenn Patent reproduced below, Auto Line Number circuit 30 is configured to receive one or more synchronization inputs. *See* Glenn Patent, Fig 1; 3:29-44 ("The H and V pulses … are applied to a block 30 labeled 'Auto Line Number.'"). Figure 1 illustrates an "H&V" input where one of ordinary skill in the art would understand that "H" or "H pulse" represents horizontal synchronization signals (or H sync) or "V' or "V pulse" represents vertical synchronization signals (or V sync). Each H sync represents a horizontal line on a frame or screen and each V sync signifies a start of a new frame or screen.
>
> Recognizing the number of lines from H sync and V sync signals was well known in the art at [the] time of the invention of the Glenn Patent. One of ordinary skill in the art, for example, would understand that the number of lines can be recognized by counting synchronization signals. **The corresponding structure is a counter that increments on each H sync and resets on a V sync** so that the maximum value of the counter represents the number of lines in the frame or field (e.g., for an input signal having 525 lines, 525 H sync pulses are received between V sync pulses). This structure was very well known and commonly used in the art at the time the Glenn Patent was filed. In my opinion, one of ordinary skill in the art would readily understand this structure from the details in the specification of the Glenn Patent. (emphasis added) (footnotes omitted).

(Validity Report at 39-40, A862-63) (emphasis added). Dr. Von Herzen's Validity Report further states:

> At the time of the invention of the Glenn Patent, using sync signals to recognize the number of lines in an input format was well known to one ordinary skill in the art. . . . For example, [prior art reference] Dalton specifically discloses a line counter 52 that counts line pulses received from a synch separator 58. The foregoing is just one of many examples that demonstrate that ***the use of counters was well known in the art at the time of the invention of the Glenn Patent.*** Accordingly, additional structure would not be necessary to perform the recited function, since such structure would have been and was well known to one of ordinary skill in the art.

(*Id.* at 41, A864) (emphasis added). There is no dispute on this point. In fact, the Flat Screen Sellers' Statement of Material Facts in Support of Summary Judgment makes this clear: "Recognizing the number of lines from horizontal and vertical sync signals was very well known in the art at the time of the invention of the '385 Patent. One of ordinary skill in the art, for example, would understand that the number of lines can be recognized by counting synchronization signals." (DE-234-2 at ¶C-3, A771).

The Flat Screen Sellers retained Dr. Clifford Reader as their technical expert. Dr. Reader's testimony at the *Markman* hearing was remarkably similar to the statements contained in Dr. Von Herzen's Validity Report. Dr. Reader explained:

> Dr. Reader: So let's describe how the signal is processed ***according to the patent and its description***.
>
> So I have shown here, for the purposes of illustration, that we're receiving 525 lines. . . .
>
> So we receive a signal with the 525-line format. That signal goes two places. All three components go to the analog to digital converters where they're converted into digital format, but one of the components also goes to the sync separator 24.
>
> The purpose of the sync separator is to strip out the horizontal sync pulses and the vertical sync pulses, and those pulses are sent on the line marked to [H&V] here, and they go to the unit 30, which is the auto line number.
>
> What the auto line number does is automatically derive the number of lines in the analog input signal from the sync signal. ***The way it does that is that it simply counts how many of those horizontal sync pulses occurred before a vertical sync pulse occurred.***
>
> That simply tells us how many lines there are in the input format before we've gotten to the end of the frame at the bottom.
>
> The Court: I understand the horizontal and the vertical sync pulses.
>
> Just walk with me. Number 30 automatically derives --that is the thing that is, in your opinion, doing the counting.
>
> Dr. Reader: ***That's what the patent teaches us. It tells us that it's going to do that counting, yes.***

The Court: So you agree with Doctor Von Herzen?

Dr. Reader: That's correct.

The Court: He agrees with you on that?

Dr. Reader: That's right.

(*Markman* Hearing (September 20, 2013) at 129:3-130:11, A362-63) (emphasis added).

Dr. Reader continued this discussion at the October 2, 2013 *Markman* hearing. To start the testimony, Counsel for the Flat Screen Sellers placed Figure 1 of the specification in front of Dr. Reader. (*Markman* Hearing (October 2, 2013) at 46:9-10, A499). Dr. Reader then testified as follows:

> Dr. Reader: So what we discussed the previous time we were in the hearing was that coming from one of the three components on the input shown as the Y input in this figure, we have the signal passing through the sync separator 24 and the function of the sync separator is to remove the horizontal and vertical sync pulses from the input signal. And that's shown on the line coming out of that unit 24 where we see H&V at the bottom of the screen
>
> The Court: What do you mean by remove?
>
> Dr. Reader: If you remember, Your Honor —
>
> The Court: Just to segregate them out to send them over to the auto line box 30?
>
> Dr. Reader: That's right.
>
> The Court: ***So the auto box can count?***
>
> Dr. Reader: ***That's correct.***

> The Court: Okay.
>
> Dr. Reader: ***So the next step in the process is that they, indeed, go into the auto line number circuit 30 and that's where, as Your Honor just said, there is a count of the number of lines in the input signal which then provides the format of that input signal.***
>
> The Court: So you are saying that in the auto line, it is a little computer doing counting or --
>
> Dr. Reader: ***There is some element that counts, yes.***

(*Id*. at 46:13-47:11, A499-500). Dr. Reader further explained that, by looking at Figure 1 of the specification, "we can see that the information that's being used to recognize the number of lines in the input is these horizontal and vertical sync pulses that are coming in from sync [separator] 24." (*Id.* at 51:18-22, A504). He continued, again with reference to Figure 1:

> . . . we have coming in on this line marked H & V is a succession of pulses in time. So in the example that I showed the Court last time where I used ten lines as my simple example, we saw the input video signal was a succession of lines of data separated by the horizontal pulses that ended once we got to a vertical sync pulse that said we had reached the bottom of the frame.
>
> So when we strip out just the pulses which is what the sync [separator] 24 does, then passing along the line marked H & V in figure 1 is a succession of two kinds of pulses. So we get a succession of horizontal pulses, ten in my example, followed by a different kind of pulse which is the vertical pulse.
>
> So this act of recognition of the format is based on receiving this time sequence of those two different kinds of pulses. ***And the way that that information is used to count the number of the horizontal***

> ***pulses until the vertical pulse arrives and then you know the count is complete.*** That's how you use that data to recognize the number of lines in the input signal.

(*Id.* at 52:3-21, A505). Dr. Reader then emphasized, "I think the point here is that ***what is disclosed in the patent*** is a train of pulses that ***have to be counted.***" (*Id.* at 53:4-6, A506) (emphasis added). The Court questioned Dr. Reader on this in the following exchange:

> The Court: But I don't see where it says you have to count it in the patent.
>
> Dr. Reader: The patent doesn't use that word, but because the nature of the signal that is coming through sync separator 24 is merely some unknown, some arbitrary, or as the patent title says adaptive number of pulses, ***the way that the patent is designed, you have to perform that count as an active duty in order to know the count as opposed to just being provided with the count.***
>
> The Court: So you are saying that someone skilled in the art always knows that there is a -- that deriving means counting?
>
> Dr. Reader: I am describing ***what is necessary according to the patent*** in order to derive and it says to me that ***you have to count***.

(*Id.* at 53:22-54:11, A506-7) (emphasis added). Dr. Reader concluded:

> So, I agree with you the patent doesn't say the word count. I was, I guess, using my experience a little too automatically because, ***of course, I know <u>that that's the only way that we are going to [be] able to do it.</u> But the act of recognizing that a new format has arrived is achievable with the signals shown in figure 1 <u>only by counting the number of horizontal sync pulses before the next vertical sync pulse arrives</u> . . .***

(*Id.* at 57:17-24, A510) (emphasis added).

Dr. Reader also offered a Declaration in Support of the Flat Screen Sellers' Motion for Summary Judgment. In his Declaration, Dr. Reader states that the patent does not "describe the structure used to perform [the "recognizing the number of lines"] function, the manner and process of making and using that structure, or sufficient description of the structure to evidence that the inventor was in possession of that structure at the time the patent application was filed." (DE-234-3 at ¶25. A785-86). In his *Markman* testimony, however, Dr. Reader admits the patent teaches an "element that counts" the H & V sync pulses. The record evidence is that a counter that "recognizes" the number of lines by counting H & V sync pulses was well known in the art at the time of the patent application. Dr. Reader never identified any alternative structure that counts so as to render the patent indefinite.

Notwithstanding the expert reports and testimony in which both experts agreed that that the patent discloses a counter or "element that counts", the trial court granted the Flat Screen Sellers' Motion for Summary Judgment and held that the '385 patent is invalid as indefinite. (Order at 2, A18). The trial court based its decision on statements contained in Dr. Von Herzen's *Infringement* Report and portions of his *Markman* testimony in which he discussed equivalent structure for

purposes of an ***infringement*** analysis. (Order at 5-7, A21-23). The trial court also cited several short passages from the depositions of three other witnesses: Dr. Glenn, John W. Marcinka, and Frederick Kahn. (Order at 4-5, 7, A20-21, A23). These witnesses were questioned generally about Auto Line Number 30 and the "recognizing" function, but none of these witnesses was asked the direct question: "As a person of ordinary skill in the art, are you able to determine from the patent the structure that corresponds to the function of recognizing the number of lines of said input/first format?" From these citations, the trial court concluded that the patent is indefinite, despite the testimony of both technical experts that the corresponding structure that performs the "recognizing" function is a counter. It is this decision that is the subject of FAU's appeal.

SUMMARY OF ARGUMENT

The Patent Act requires that a patent's specification "conclude with one or more claims **particularly pointing out** and **distinctly claiming** the subject matter which the applicant regards as his invention. 35 U.S.C. §112, ¶b (emphasis added). In the Supreme Court's recent decision of *Nautilus v. Biosig Instruments, Inc.,* 134 S.Ct. 2120 (2014), the Court reversed the Federal Circuit's formulation for determining whether a patent is invalid for indefiniteness, holding that the

"insolubly ambiguous" standard did not satisfy the statute's definiteness requirement.

Rather, the Court held:

> In place of the "insolubly ambiguous" standard, we hold that a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.

Id. at 2124.

Three pre-existing legal principles were nonetheless preserved. The first is that the issue of definiteness is to be evaluated from the perspective of someone skilled in the relevant art. *Id.* at 2128 (citing *General Electric v. Wabash*, 304 U.S. 364, 371 (1938)). On this issue, there is virtually no light between the two experts retained by the parties — Dr. Reader and Dr. Von Herzen. Both were in agreement that Dr. Glenn's patent described a "train of pulses" that have to be counted. (*Markman* Hearing (October 2, 2013) at 53:4-6, A506)

Also reaffirmed was the notion that in assessing definiteness, claims are to be read in light of the patent's specification and prosecution history. *Nautilis,* 134 S.Ct. at 2128 (citing *United States v. Adams*, 383 U.S. 39, 48-49 (1966) (specification) and *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722, 741 (2002) (prosecution history). Here again, the two opposing experts

were in substantial agreement. Both cited to Figure 1 and agreed that sync pulses disclosed in the patent would require counting, even though there was no specific mention of a counter in the specification. (*Markman* Hearing (October 2, 2013) at 53:22-54:11 and 57:17-24, A506-7 and A510-11).

Third, the principle that "[d]efiniteness is measured from the viewpoint of a person skilled in [the] art *at the time the patent was filed*" was reaffirmed. (emphasis in original). Once more, the parties were in agreement that recognizing the number of lines by counting sync pulses was well known in the art at the time the patent was filed. (DE-234-2 at ¶C-3, A771).

At its core, the essential inquiry mandated by *Nautilus* is not materially different from pre-*Nautilus* jurisprudence. "[A] patent must be precise enough to afford clear notice of what is claimed, thereby 'appris[ing] the public of what is still open to them.'" *Nautilus,* 134 S.Ct. at 2129 (citations omitted). Notably, the Supreme Court in *Nautilus* declined to resolve whether the particular patent-in-suit was indefinite, and elected to remand the case back for further consideration under the new standard. This Court is currently considering the patent in *Nautilus* and whether it meets the "reasonable certainty" standard.

It is against this backdrop that the '385 Patent and the trial court's decision must be examined. Here, both technical experts agreed that the function of

"recognizing the number of lines" in the incoming video signal is accomplished by a counter that counts the H sync pulses and resets on each V sync pulse. The experts agreed that Figure 1 of the patent discloses this counter based on the description of H sync and V sync pulses entering Auto Line Number 30. It is also clear that the structure for recognizing the number of lines is not what is novel to this invention. It was well known by those skilled in the art that a counter could be used by a scan converter to recognize the number of lines in the incoming signal. Under these circumstances, the trial court erred in invalidating the patent as indefinite. This Court should reverse the trial court and enter an Order holding that the '385 Patent is not invalid and is sufficiently definite to satisfy 35 U.S.C. §112. In the alternative, this Court should vacate the trial court's order and remand this case for a full evidentiary hearing to determine whether a person of ordinary skill in the art would understand the patent to disclose a specific counting structure corresponding to the subject function.

ARGUMENT

A. Standard of Review

The determination of whether a patent is indefinite, and therefore, invalid, has traditionally been treated as a question of law that is reviewed *de novo. Intel Corp. v. Via Technologies, Inc.*, 319 F.3d 1357, 1365 (Fed. Cir. 2003). This

standard of review is currently under consideration by the United States Supreme Court in *Teva Pharmaceuticals, Inc. v. Sandoz, Inc.*, 134 S.Ct. 1761 (2014). In that case, the Supreme Court will determine whether the clearly erroneous standard should apply to the factual underpinnings of a district court's indefiniteness ruling. Here, under either standard, the trial court should be reversed.

B. Governing Legal Principles

"[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus,* 134 S.Ct. at 2123.

The definiteness standard strikes a balance between fostering innovation and providing notice of what is prohibited. *Nautilus*, 134 S.Ct. at 2128-29. "[T]he definiteness requirement, so understood, mandates clarity, while recognizing that absolute precision is unattainable." *Id.* at 2129. Moreover, "the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter." *Id.* (citations omitted).

Patents need not include subject matter that is known in the field of the invention and is in the prior art, for patents are written for persons experienced in the field of the invention. *S3 Inc. v. nVIDIA Corp.,* 259 F.3d 1364, 1371 (Fed. Cir.

2001). To hold otherwise would require every patent document to include a technical treatise for the unskilled reader. *See Atmel Corp. v. Info. Storage Devices, Inc.,* 198 F.3d 1374, 1382 (Fed. Cir. 1999) ("The specification would be of enormous and unnecessary length if one had to literally reinvent and describe the wheel."); *W.L. Gore & Assoc., Inc. v. Garlock, Inc.,* 721 F.2d 1540, 1556 (Fed. Cir. 1983) ("Patents, however, are written to enable those skilled in the art to practice the invention, not the public.")*.*

A patent is presumed to be valid. Thus, "the evidentiary burden to show facts supporting a conclusion of invalidity is one of clear and convincing evidence." *Enzo Biochem v. Applera Corp.*, 599 F.3d 1325, 1331 (Fed. Cir. 2010); *Intel Corp. v. Via Technologies, Inc.*, 319 F.3d 1357, 1366 (Fed. Cir. 2003) ("any fact critical to a holding on indefiniteness . . must be proven by the challenger by clear and convincing evidence"); *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001) ("any facts supporting a holding of invalidity must be proved by clear and convincing evidence"). This means that a party seeking to invalidate a patent as indefinite must prove by clear and convincing evidence "that the specification lacks adequate disclosure of structure to be understood by one skilled in the art as able to perform the recited functions." *Intel*

Corp., 319 F.3d at 1366; *Intellectual Property Development v. UA-Columbia Cablevision of Westchester, Inc.*, 336 F.3d 1308, 1319 (Fed. Cir. 2003).

The evidentiary burden influences the summary judgment inquiry. "[W]here the . . . 'clear and convincing' evidence requirement applies, the trial judge's summary judgment inquiry as to whether a genuine issue exists will be whether the evidence presented is such that a jury applying that evidentiary standard could reasonably find for either the plaintiff or the defendant." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). As this Court has stated, "a moving party seeking to invalidate a patent at summary judgment must submit such clear and convincing evidence of facts underlying invalidity that no reasonable jury could find otherwise." *Trimed v. Stryker Corp.*, 608 F.3d 1333, 1340 (Fed. Cir. 2010). Moreover, in considering a motion for summary judgment, the court must view the evidence in the light most favorable to the non-moving party. *Ricci v. DeStefano*, 129 S.Ct. 2658, 2677 (2009).

C. The Patent Discloses A Counter That Increases On The H Sync And Resets On The V Sync To Perform The "Recognizing The Number of Lines Function" And This Court Should Reverse The Trial Court And Enter An Order Finding That The Patent Sufficiently Discloses Structure To Perform The Subject Function And Is Not Indefinite

There are two steps in construing a means-plus-function limitation. First, the Court must determine the claimed function. Second, the "court must identify the corresponding structure in the written description of the patent that performs that function." *Applied Medical Resources Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1332 (Fed. Cir. 2006).

Here, for step one, the claimed function at issue is "recognizing the number of lines in said input/first format." For step two, the disclosed structure for performing the "recognizing the number of lines" function is a counter inside of Auto Line Number 30 that increments on the H syncs and resets on the V syncs.

In addressing the question of whether a means-plus-function limitation satisfies the definiteness requirement, the focus is on whether one skilled in the art would understand that the specification of the patent discloses structure capable of performing the function recited in the claim limitation. *Nautilus*, 1345 S.Ct. at 2128; *Intellectual Property Development, 336 F.3d at 1319*; *HTC Corp. v. IPCom GmbH & Co., KG*, 667 F.3d 1270, 1279 (Fed. Cir. 2012) (citing *Budde*, 250 F.3d at 1376 ("Whether a specification adequately sets forth structure corresponding to a claimed function is viewed from the perspective of one skilled in the art.")); *Telcordia Techs., Inc. v. Cisco Sys., Inc.*, 612 F.3d 1365, 1377 (Fed. Cir. 2010)

("the specification need only disclose adequate defining structure to render the bounds of the claim understandable to an ordinary artisan").

Moreover, "the amount of detail that must be included in the specification depends on the subject matter that is described and its role in the invention as a whole, in view of the existing knowledge in the field of the invention." *Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1385 (Fed. Cir. 2011); *see also Nautilus*, 134 S.Ct. at 2129 ("the certainty which the law requires in patents is not greater than is reasonable, having regard to their subject-matter").

Here, as evidenced by the record, a person of ordinary skill in the art who has read the '385 Patent understands that a counter that increases on H syncs and resets on V syncs is the only structure *disclosed* by the '385 Patent for performing the "means for recognizing" function. Figure 1 of the '385 Patent discloses to a person of ordinary skill in the art definite structure for "recognizing the number of lines in said input format." According to Figure 1, two circuit pulses — H Sync and V Sync — enter the Auto Line Number 30.

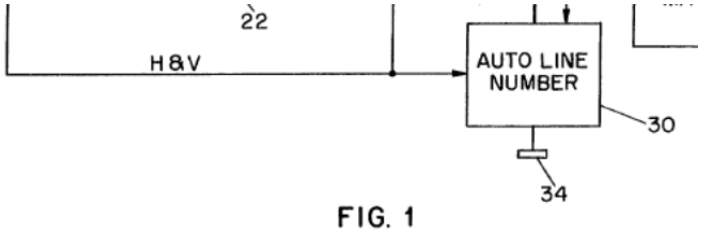

FIG. 1

Importantly, the only role of the H sync and V sync pulses is to cause the counter inside the Auto Line Number 30 to "recognize the number of lines" in each frame by counting the H sync pulses and resetting on the V sync pulses. Since there is no other use for the H sync and V sync pulses in the Auto Line Number 30, a person of ordinary skill in the art would ***immediately*** understand the structure disclosed to be something that counts pulses.

Here, both technical experts agreed that the specification of the '385 Patent requires the counting of synchronization pulses to "recognize the number of lines." Both technical experts agreed that the specification discloses something that counts — Dr. Reader referred to it as an "element that counts," whereas Dr. Von Herzen referred to it as a counter. This, and only this, is the "corresponding structure" or "disclosed structure" for the function at issue.

Dr. Von Herzen's Validity Report identifies the disclosed structure as a counter that increments on each H sync and resets on a V sync. (Validity Report at

39-40, A862-63). And, Dr. Reader's *Markman te*stimony confirms this same structure.

Dr. Reader testified that "the patent teaches us" that its "going to do that counting" and that he and Dr. Von Herzen are in agreement on this point. (*Markman* Hearing (September 20, 2013) at 129:3-130:11, A362) (emphasis added).

Dr. Reader testified that Auto Line Number 30 includes "some element that counts." (*Markman* Hearing (October 2, 2013) at 46:13-47:11, A499-500

Dr. Reader testified that even though the patent does not use the word "count" he knows, as a person of ordinary skill in the art, that the way the adaptive scan converter recognizes the number of lines is to count the H syncs and reset on the V sync. (*Id.* at 53:22-54:11 and *Id.* at 57:17-24, A506-7 and A510).

Moreover, there is no dispute that this structure — a counter that increases on H syncs and resets on the V sync — was well known in the art at the relevant time. (DE-234-2 at ¶C-3, A771). This structure and its use to "recognize the number of lines" in a scan converter was not novel, and elaborate detail of the structure was not necessary (or even desired) to satisfy Section 112.

Dr. Reader never identified any alternative structure that counts H & V sync pulses. He admitted that the patent teaches an "element that counts" in order to

recognize the number of lines. Having made this admission, it was the Flat Screen Sellers' burden to come forward with evidence that there was more than one structure that could count the H sync and V sync pulses so as to render the patent indefinite. No such evidence was presented. *See ELCOMMERCE.COM, Inc. v. SAP AG*, 745 F.3d 490 (Fed. Cir. 2014)[6] (vacating finding of indefiniteness where defendant lacked expert testimony to support its position).

Based on the foregoing, the trial court erred in finding the patent indefinite. The experts were in agreement, and the trial court's decision should be reversed. *See, e.g.*, *Intellectual Property Development, Inc.,* 336 F.3d at 1319-20 (reversing trial court's decision holding patent indefinite where the experts agreed as to the corresponding structure).

D. None of the Other Evidence In The Record Is Sufficient To Invalidate The Patent, Particularly Where, As Here, Both Technical Experts Agreed That The Patent Discloses A Counter To Perform The Subject Function

1. Evidence Related To Infringement Is Irrelevant

The trial court based its ruling in large part on evidence related to infringement rather than the expert reports and testimony regarding what structure

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[6] The Court subsequently vacated this opinion upon the parties' joint stipulation of dismissal. 564 Fed.Appx. 599 (June 6, 2014).

is disclosed in the patent. This infringement evidence — which related to a different issue — is not relevant to indefiniteness, and the trial court erred in relying on it.

Claim construction and infringement are two separate issues. Once a claim in construed, the next phase is the infringement analysis, which examines the structure in the accused product to determine whether there is infringement. For purposes of the infringement analysis, a claim written in means-plus-function format is *not* limited to the exact structure disclosed in the patent (*i.e.*, the corresponding structure). Rather, pursuant to 35 U.S.C. §112, the claim is "construed to cover the corresponding structure, material, or acts described in the specification ***and equivalents thereof***." (emphasis added). "Literal infringement of a means-plus-function claim limitation requires that the relevant structure in the accused device perform the identical function recited in the claim and be identical or ***equivalent*** to the corresponding structure in the specification." *Applied Medical Resources*, 448 F.3d at 1333 (emphasis added). The law provides that "[o]nce the relevant structure in the accused device has been identified, a party may prove it is equivalent to the disclosed structure by showing that the two perform the identical function in substantially the same way, with substantially the same result." *Id.*

Here, Dr. Von Herzen provided an **Infringement** Report in which he discussed equivalent structure and he also gave testimony at the *Markman* hearing related to equivalent structure. The trial court erroneously relied on these statements to hold the patent indefinite. The trial court's indefiniteness analysis should have focused exclusively on testimony and statements regarding the disclosed structure — the counter — for performing the "recognizing the number of lines" function. The trial court invalidated the patent in error, and its decision should be reversed.

2. The Testimony Of The Other Witnesses Is Inconclusive

The trial court also relied on testimony of Dr. Glenn, John W. Marcinka, and Frederic Kahn to support its summary judgment decision. The vague and inconclusive testimony of these three witnesses – which never addresses the ultimate question -- cannot invalidate the patent, where both technical experts agreed that the patent discloses a counter or an "element that counts." This Court should reverse the trial court and enter an Order holding that the '385 Patent is not indefinite.

E. Alternatively, There Was Insufficient Evidence For The Trial Court To Grant Summary Judgment On Indefiniteness, And This Court Should Vacate The Trial Court's Order and Remand For Further Proceedings, Including an Evidentiary Hearing Regarding Whether A Person Of Ordinary Skill In The Art Would Understand that the Patent Discloses a Counter to Perform the Recognizing the Number of Lines Function

The expert reports and/or testimony of the two technical experts, Dr. Reader and Dr. Von Herzen, are such that this Court should enter an Order holding that the patent is sufficiently definite to satisfy 35 U.S.C. §112. However, to the extent there is any ambiguity in the record on this issue, the Court should vacate the trial court's summary judgment decision because the Flat Screen Sellers did not prove the facts underlying invalidity by clear and convincing evidence. At a minimum, Dr. Reader's *Markman* testimony and Dr. Von Herzen's Validity Report raise a genuine issue of material fact that precludes entry of summary judgment, particularly when the evidence is viewed in the light most favorable to FAU. Thus, the Court should vacate the trial court's decision and remand this case for further proceedings on indefiniteness, including a full evidentiary hearing on whether a person of ordinary skill in the art would understand the patent to disclose a specific structure for the function at issue. *See ELCOMMERCE.COM, Inc.,* 745 F.3d 490 (Fed. Cir. 2014) (vacating summary judgment decision on indefiniteness and remanding for further proceedings); *Aristocrat Technologies Australia PTY*

LTD., v. Multimedia Games, Inc., 266 Fed.Appx. 942 (Fed. Circ. 2008) (Unpublished) (finding that genuine issues of material fact precluded summary judgment of invalidity and remaining for further proceedings).

CONCLUSION

The trial court erred in granting summary judgment and holding that the '385 Patent is invalid for indefiniteness. Both technical experts agreed that the patent discloses a counter to perform the subject function, and this Court should reverse the trial court and enter an Order finding that the patent satisfies 35 U.S.C. §112 . In the alternative, the Court should vacate the trial court's summary judgment decision and remand this case to the trial court for a full evidentiary hearing on whether a person of ordinary skill in the art would understand the patent to disclose a specific structure to perform the recognizing the number of lines function.

Respectfully Submitted

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January 13, 2015

ADDENDUM

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
Case No. 12-CV-80701-SEITZ(consolidated)

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ACER, INC., *et al.*,
Defendants.
_____/

CASE NO. 12-80694-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ASUS COMPUTER INTERNATIONAL, *et al.*,
Defendants.
_____/

Case No.:12-80697-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
TPV TECHNOLOGY LIMITED, *et al.*,
Defendants.
_____/

Case No.:12-80701-CIV-SEITZ

ORDER GRANTING DEFENDANTS' MOTION FOR SUMMARY JUDGMENT

THIS MATTER is before the Court on the Defendants' Combined Motion for Summary Judgment of Invalidity and Non-Infringement [DE-221].[1] Plaintiffs allege that Defendants have infringed on their patent, U.S. Patent No. 5,349,385 (the '385 Patent), which is for an adaptive scan converter that converts different input formats to a fixed output format for display on screens, such as computer monitors or televisions. Defendants move for summary judgment on

[1]While the Motion for Summary Judgment was filed by the defendants in all three cases, it was only docketed in Case No. 12-80701. All record citations are to the docket in Case No. 12-80701-CIV.

three grounds: (1) the '385 Patent's claims are indefinite under 35 U.S.C. § 112(b); (2) the accused products do not infringe as a matter of law; and (3) the prior art anticipates and renders the '385 Patent obvious.

Having considered the parties' submissions and all the record evidence, in the light most favorable to the non-moving party, the Court will grant Defendants' motion for summary judgment. Defendants have established by clear and convincing evidence that the '385 Patent is indefinite and, therefore, invalid because it does not clearly link corresponding structure to the "means for recognizing the number of lines in said [input/first[2]] format." Plaintiffs have not rebutted Defendants' evidence because they have not shown that one of ordinary skill in the art would know what specific structures perform the means for recognizing function set out in the Patent. Because the '385 Patent does not inform "with reasonable certainty, those skilled in the art about the scope of the invention," the Patent is invalid. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. – , 134 S. Ct. 2120, 2124 (2014)

I. Undisputed Material Facts

A. The Patent

Plaintiffs hold U.S. Patent No. 5,349,385.[3] The invention can convert any of several input formats to a fixed output format for display on screens, such as computer monitors and televisions. While scan version technology had been in existence since the 1960s, the '385

[2]The parties agree that the terms "input format" and "first format" are essentially interchangeable in the '385 Patent.

[3]The patent application was filed in 1992 and the Patent issued in 1994. The record does not disclose whether the Patent was ever reduced to practice, licensed, or otherwise widely produced and used.

Patent's novelty came from its ability to perform the conversion without storing an entire frame of information, as required by the prior art. The '385 Patent uses means-plus-function language, as permitted by 35 U.S.C. §112(f), for every limitation of all ten claims of the Patent, except for the preambles. In their Joint Claim Construction Statement [DE-85], the parties agreed that the specification discloses "Auto Line Number 30" as purported structure corresponding to 14 of the 34 limitations recited by the Patent. While the parties disagree whether Auto Line Number 30 discloses structures capable of performing the corresponding functions, they do agree that Auto Line Number 30 is the corresponding structure for, among other things: (1) the "means for recognizing the number of lines in said [input/first] format" (claims 1-10); (2) the "means [for] automatically deriving an interpolation ratio" (claims 1-10); and (3) the "means for comparing the number of lines in a current [input/first] signal with said stored interpolation ratios and responsively to a match deriving the [required interpolation ratio/interpolation required]" (claims 3, 5, 8, 10). Auto Line Number 30 is shown in Figure 1 of the specification, as part of a functional block diagram. In the Figure, Auto Line Number 30 is a box, with no internal circuitry or other structure shown. Figure 1 is set out in Appendix A.

The only structure explicitly set out in the Patent as part of Auto Line Number 30 is set out in the following sentence: "These ratios are stored in memory (RAM) embodied in block 30 and compared with the current input to create a match; this match determines the scan conversion routine." ('385 Patent, 3:52-55.) No other structure corresponding to Auto Line Number 30 is explicitly set out in the Patent.

B. The Experts and their Interpretations of Auto Line Number 30

Defendants first raised their invalidity contentions in their Preliminary Invalidity

Contentions filed on March 15, 2013 [DE-63]. Because the Patent does not explicitly disclose structure associated with Auto Line Number 30, other than the RAM, the relevant evidence is the testimony and reports of those ordinarily skilled in the art. In this case, the parties have submitted the deposition testimony of the inventor of the '385 Patent, the deposition testimony of the manager of the laboratory in which the inventor worked at the time of the invention, and the deposition testimony of Plaintiffs' industry expert. Additionally, both sides have retained technology experts. The technology experts testified at the *Markman* hearing on September 20, 2013 and October 2, 2013. The parties have also submitted for consideration the February 24, 2014 Initial Validity Expert Report of Plaintiffs' technology expert, Dr. von Herzen; the February 3, 2014 Initial Infringement Report of Dr. von Herzen; the March 31, 2014 Declaration of Dr. von Herzen; the February 24, 2014 Expert Report of Defendants' technology expert, Dr. Reader; and the March 17, 2014 Declaration of Dr. Reader.

1. The Inventor

The inventor of the patented invention, Dr. William Glenn, testified that a person could not just go into Radio Shack and buy an Auto Line Number 30 circuit, that he did not know whether one could find an Auto Line Number 30 on a specification sheet from a manufacturer, and that he did not recall ever hearing the term outside the context of the Patent. (Glenn Dep.[4] 211:21-212:2; 212:13-20.) When asked if he knew of a circuit that could perform the function of recognizing the number of lines in said input format, Dr. Glenn testified that "there are several possible circuits that could do that." (*Id.* at 216:22-217:5.) In response to the question of whether he knew what circuit would be used for recognizing the number of lines in an input

[4]Portions of the Glenn Deposition are filed at DE-224-32 and DE-224-33.

signal, Dr. Glenn responded, "Not really, you would have to figure out what the circuit signal would be." (*Id.* at 219:9-20.) Dr. Glenn's deposition was taken over several days. He testified that between days, he read the Patent. (*Id.* at 467:8-10.) Despite reviewing the Patent, Dr. Glenn stated that he did not find any more information about what Auto Line Number 30 is. (*Id.* at 468:17-23.)

2. The Markman Hearing

The first expert discussion of the structure of Auto Line Number 30 was at the *Markman* hearing on September 20 and continued on October 2, 2013. Plaintiffs' expert, Dr. Brain von Herzen, stated that Auto Line Number 30 was a "digital state machine," which meant a digital circuit that "can take several inputs, stores information in memory, and generates an output." (DE-109: 31:7-17.) Later in the *Markman* hearing, Dr. von Herzen testified that:

> It's my understanding that a sync signals, a plurality of sync signals, can be used to do the recognition. So that's one way that it can be done. It could be done, for example, by counting. It could be done, for example, by timing. The time differences between the sync signals, for example, the time between the horizontal syncs and the time and the number . . . sync signals are an example of how you can measure the number of lines.

(DE-130, 29:13-25.) He continued:

> Furthermore, there are other features -- I mean, the sync signals are examples that are specifically cited here about the features that can be counted. In addition, you can be looking at horizontal features such as the front porch or the back porch of a horizontal scan line or a vertical retrace interval, could be other properties that could be measured to those who have skill in the art and these are ways of measuring the input signal and recognizing numbers of lines. It's not explicitly talked about so much in this patent, but this is a set of examples of what could be used to recognize the number of lines.

(DE-130, 30:16-31.) At the *Markman* hearing Defendants' expert, Dr. Clifford Reader, in response to the Court's question, "So you are saying that in the auto line, it is a little computer doing counting or –," stated that Auto Line Number 30 contains "some element that counts."

(DE-130, 47:9-11.)

3. The Expert Reports and Declarations

In his February 3, 2014 Initial Infringement Expert Report, Dr. von Herzen stated that Auto Line Number 30 is the corresponding structure for the function "recognizing the number of lines in said input format" and that "a recognizing component (*e.g.*, a counter, a timer, *etc.*) of the Auto Line Number circuit 30 would perform this function." (DE-224-10 at 4.) In the same report, Dr. von Herzen refers to the "recognizing" function as being performed by "a counter component (or equivalent timing component) . . ." (*Id.* at 5.) Dr. von Herzen further states that "a software implementation of the structural components was available at the time of issuance of the ['385] Patent." (*Id.* at 6.) Later, in his February 24, 2014 Initial Validity Expert Report, Dr. von Herzen states that one ordinarily skilled in the art would know that the structure corresponding to the "means for recognizing" is "a counter." (DE-224-1 at 50.) In the same Validity Report, Dr. von Herzen states that three earlier patents do not disclose a means for recognizing the number of lines. (DE-224-2 at 43-44; 56; DE-224-3 at 3-4.) However, in his later Declaration, Dr. von Herzen states that the same three patents *disclose* "the same counter of known structure that is disclosed in the ['385] Patent to a person of ordinary skill in the art." (DE-248 at ¶¶16-18.)

In his Declaration in Support of Summary Judgment, Defendants' expert, Dr. Reader states that "'Auto Line Number 30' is not something well-known in the art that performs a common electrical function." (DE-223 at 8.) Dr. Reader further states that a person of ordinary skill in the art would not know from reading the Patent to employ a "digital state machine" to achieve the claimed functionality of recognizing the number of lines. (*Id.* at 10.) At his

deposition, Dr. Reader stated that "a counter is one possible way to do that." (DE-203, 139:1-2.) However, the context of that statement is not clear because of the redaction of the transcript that was filed with the Court.

4. Others Skilled in the Art

While not offered as technical experts, two other witnesses testified at their deposition that they did not know what Auto Line Number 30 is. John Marcinka, Dr. Glenn's laboratory manager at the time of the invention, was shown the '385 Patent and asked if he knew what the Auto Line Number 30 box in the figure was and he replied "no." (Marcinka Dep.[5] 77:21-25.)[6] Similarly, Plaintiffs' industry expert, Dr. Frederic Kahn also stated that he did not know what was inside the box shown as Auto Line Number 30. (Kahn Dep.[7] 26:5-16; 39:7-11.) Later, Dr. Kahn testified that the Patent disclosed a counter (*id.* at 108:8-20), but when questioned further he was unable to identify where the Patent identifies a "counter" (*id.* at108:21-109:23). At his deposition, Dr. Kahn stated that he was someone with "45 years of knowledge and study preceded by university studies that are relevant – directly relevant." (*Id.* at 27:6-8.)

II. Discussion

A. The Indefiniteness Standard

Neither side disputes that the claims at issue are means-plus-function claims. As this

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[5]An excerpt of the Marcinka deposition is filed at DE-224-27.

[6]Plaintiffs later filed the Declaration of John W. Marcinka [DE-242], in which Marcinka directly addresses this statement given during his deposition. However, by separate order the Court struck the Declaration [DE-299]. Thus, only Marcinka's deposition testimony remains part of the record before the Court.

[7]Portions of the Kahn deposition are filed at 224-29.

Court previously stated in the Order re: Claims Construction [DE-151], means-plus-function claims are permitted under 35 U.S.C. § 112(f). Under § 112(f), formerly section 112, paragraph 6, "an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts *described in the specification* and equivalents thereof." (emphasis added). The Federal Circuit has explained:

> The duty of a patentee to clearly link or associate structure with the claimed function is the quid pro quo for allowing the patentee to express the claim in terms of function under section 112, paragraph 6. *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001). Section 112, paragraph 6 was intended to allow the use of means expressions in patent claims without requiring the patentee to recite in the claims all possible structures that could be used as means in the claimed apparatus. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997). However, "[t]he price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof." *Id.* **If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid that price but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification.** Such is impermissible under the statute.

Medical Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (emphasis added). Thus, if a patent does not clearly disclose the structure for a means-plus-function term, the claim is indefinite. *Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363 (Fed. Cir. 2012).

Further, §112(b) sets out the general standard for definiteness: "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." The Supreme Court recently addressed the definiteness requirement of § 112(b) in *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. –, 134 S. Ct. 2120 (2013). In *Nautilus*, the Court emphasized the

importance of clarity in the specification, stating that "a patent's claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty. The definiteness requirement . . . mandates clarity, while recognizing that absolute precision is unattainable." *Id.* at 2129.[8]

While the understanding of one skilled in the art in no way relieves the patentee of adequately disclosing sufficient structure in the specification, interpretation of what is disclosed must be made in light of the knowledge of one skilled in the art. *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1380 (Fed. Cir. 1999). Thus, a "proper indefiniteness analysis asks first whether structure *is* described *in the specification*, and, if so, whether one skilled in the art would identify the structure from the description." *Biomedino, LLC v. Waters Technologies Corp.*, 490 F. 3d 946, 952 (Fed. Cir. 2007) (internal quotations omitted) (first emphasis in original; second emphasis added). Accordingly, the dispositive inquiry is whether one of ordinary skill in the art would understand the written description itself to disclose a structure, not simply whether such a person, reading the specification, would be capable of implementing a structure to perform the function. *Id.* at 953. Thus, "a bare statement that known techniques or methods can be used does not disclose structure." *Id.*

Neither side disputes that a party that seeks a finding of indefiniteness, must establish that

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[8]This standard differs from the one relied on by Plaintiffs in their opposition to the motion. Plaintiffs cite to *Exxon Research & Engineering Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001), for the standard set out therein:

> If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.

The *Nautilus* decision has clearly rejected this looser standard of definiteness.

the patent is indefinite by clear and convincing evidence. *See TecSec, Inc. v. International Business Machines Corp.*, 731 F.3d 1336, 1349 (Fed. Cir. 2013). Further, whether a patent is indefinite is a matter of law and, thus, appropriate for summary judgment. *Ancora Technologies, Inc. v. Apple, Inc.*, 744 F.3d 732, 734 (Fed. Cir. 2014).

B. The '385 Patent is Indefinite

Defendants' indefiniteness position is that the '385 Patent does not disclose any structure, other than a memory, corresponding to Auto Line Number 30 and its agreed functions of: (1) "recognizing the number of lines in said [input/first] format;" (2) "automatically deriving an interpolation ratio;" and (3) "comparing the number of lines in a current [input/first] signal with said stored interpolation ratios and responsively to a match deriving the [required interpolation ratio/interpolation required]." Plaintiffs, on the other hand, maintain that a person of ordinary skill in the art, reading the claims and specification, would recognize known structures and, therefore, under the controlling case law, the claims are not indefinite. Because the Patent is indefinite as to the corresponding structure for the "means for recognizing the number of lines in said [input/first] format" function, the Patent is invalid.[9]

The means-plus-function claim of "means for recognizing the number of lines in said [input/first] format" is used in all 10 of the numbered claims of the Patent. As previously stated, the parties agree that the structure corresponding to this claim is Auto Line Number 30.

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[9]While the Court need not determine whether the Patent is also indefinite as to the other two functions associated with Auto Line Number 30, the Court finds that the Patent is also indefinite as to these functions because there is no clearly identifiable structure associated with the means for deriving and the means for comparing. Further, the expert testimony presented by the parties indicates that one skilled in the art would be able to identify multiple structures that could perform the functions at issue. Thus, the '385 has not identified the structure corresponding to these two function with reasonable certainty.

However, Defendants assert that Auto Line Number 30 is not an actual structure that could perform the corresponding function because neither the specification nor the Figures contain an explicit description of any actual structure associated with the means for recognizing function. Because this claim is used in all 10 claims of the '385 Patent, if the Patent does not disclose corresponding structure for Auto Line Number 30, the entire Patent would be invalid for indefiniteness.

The text of the specification sets out only one structure associated with Auto Line Number 30 - "memory (RAM) embodied in block 30" - and neither side argues that this structure is associated with the means for recognizing the number of lines. Defendants assert, and Plaintiffs have not argued otherwise, that an "Auto Line Number" circuit is not a term known to persons of ordinary skill in the art outside of the context of the '385 Patent. Defendants further assert, and the undisputed evidence supports the assertion, that an "Auto Line Number" circuit is not off-the-shelf hardware or software and there are several possible structures that could perform the functions of "Auto Line Number 30." Plaintiffs do not dispute that no additional structure, beyond memory, is explicitly disclosed in the claims, specification, or figures. Plaintiffs rely on their expert to contend that a person of ordinary skill in the art would know, based on the specification, that "Auto Line Number 30" includes, among other things, a counter.[10]

Neither side disputes that, at its core, the function of the "means for recognizing the

[10]Plaintiffs also contend that Auto Line Number 30 includes a divider circuit, a look-up table associated with memory, and a difference comparator. However, none of these structures are relevant to the means for recognizing the number of lines. Moreover, none of these structures are set out in the specification or claims.

number of lines" is to count the number of lines in the input format. The Defendants argue that the '385 Patent does not disclose any structure corresponding to this function. Plaintiffs implicitly concede that the '385 Patent does not explicitly disclose any structure corresponding to the means for recognizing the number of lines but maintain that a person of ordinary skill in the art would know that the corresponding structure is a "counter," with a well-known structure at the time. However, Plaintiffs' expert, Dr. von Herzen, in his Initial Infringement Expert Report, states that "one skilled in the art would understand that a recognizing component (*e.g.*, a counter, a timer, *etc.*)" would perform the function of recognizing the number of lines. At the *Markman* hearing Dr. von Herzen stated that Auto Line Number 30 was a "digital state machine," which meant a digital circuit that "can take several inputs, stores information in memory, and generates an output." Later at the *Markman* hearing, Dr. von Herzen testified that:

> It's my understanding that a sync signals, a plurality of sync signals, can be used to do the recognition. So that's one way that it can be done. *It could be done, for example, by counting. It could be done, for example, by timing.* The time differences between the sync signals, for example, the time between the horizontal syncs and the time and the number . . . sync signals are *an example of how you can measure the number of lines*.

(emphasis added). He continued:

> Furthermore, there are other features -- I mean, the sync signals are examples that are specifically cited here about the features that can be counted. In addition, you can be looking at horizontal features such as the front porch or the back porch of a horizontal scan line or a vertical retrace interval, could be other properties that could be measured to those who have skill in the art and these are ways of measuring the input signal and recognizing numbers of lines. *It's not explicitly talked about so much in this patent, but this is a set of examples of what could be used to recognize the number of lines.*

(emphasis added). Thus, Plaintiffs' expert has offered several possible ways of achieving the function of counting – a counter, a timer, or a digital state machine – and has offered different features, or properties, that could be counted to recognize the number of lines. Further, Dr. von

Herzen noted that the Patent does not explicitly discuss how the counting is done or what features, or properties, are counted. Noticeably, at the *Markman* hearing, Dr. von Herzen did not say that it was clear from the Patent what was counted or exactly how it was counted.

Plaintiffs argue that, at the *Markman* hearing, Defendants' expert admitted that the Patent discloses a counter, as Plaintiffs now assert. However, a careful reading of Dr. Reader's testimony indicates that Dr. Reader agreed that the function was counting the number of lines but he never stated that the counting was done via a counter, timer, or digital state machine. When asked by the Court at the *Markman* hearing whether there was a little computer doing the counting, Dr. Reader replied, "There is *some element* that counts, yes." (emphasis added). Thus, contrary to Plaintiffs' assertions, Dr. Reader never stated that the '385 Patent discloses a counter as the means by which the counting function is performed; instead, Dr. Reader simply recognized that something had to do the counting.

Plaintiffs further argue that based on the testimony of Dr. Reader and Dr. von Herzen, it is clear that a person of ordinary skill in the art would understand the presence of a counter based on the '385 Patent's specification. Consequently, Plaintiffs maintain that the Patent is not indefinite. Contrary to Plaintiffs' assertions, neither expert has definitely said that a person of ordinary skill in the art would read the patent and come to the conclusion that one specific type of known counter was disclosed by the patent. Thus, the evidence indicates that the specification does not disclose a structure for counting; instead, a person of ordinary skill in the art would be able to implement a structure that could count. That, however, is not the standard. As set out in *Biomedino*, the question is whether a person of ordinary skill in the art would be able to identify from the specification a structure that could count, not whether the person would be able to come

up with a structure on his own that could perform the function. Consequently, the '385 Patent is indefinite as to the structure associated with the means for recognizing the number of lines. Because a means for recognizing the number of lines is a part of every claim, the '385 Patent is invalid.

Plaintiffs' reliance on *Telcordia Technologies, Inc. v. Cisco Systems, Inc.*, 612 F.3d 1365 (Fed. Cir. 2010), to support their contention that the absence of internal circuitry in the written description does not render the means for recognizing the number of lines indefinite, is misplaced. While *Telcordia* did find that the absence of internal circuitry does not necessarily render a claim indefinite, in *Telecordia* the evidence established that a person ordinarily skilled in the art would know how to interpret the specification and actually build the circuit at issue. *Id.* at 1377. Such is not the case here, not only is there no consensus among the skilled artisans who testified, Plaintiffs' own expert testified at the *Markman* hearing that multiple types of devices could have been used to perform the counting function and that there are multiple methods of counting. Thus, in this case, the specification has not disclosed "adequate defining structure to render the bounds of the claim understandable to an ordinary artisan." *Id.* As the Federal Circuit has previously stated, "[t]hat ordinary skilled artisans could carry out the recited function in a variety of ways is precisely why claims written in 'means-plus-function' form must disclose the particular structure that is used to perform the recited function." *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009). Here, the patentee simply did not meet the requirements of means-plus-function claiming.

II. Conclusion

As the moving parties, the burden is on Defendants to present clear and convincing

evidence that the '385 Patent is indefinite. Defendants have met this burden by establishing that: there is no structure explicitly set out in the Patent corresponding to the means for recognizing the number of lines function; the inventor, after reviewing the Patent, could not identify what structure corresponds to this function and testified that "several possible circuits" could perform the function; Plaintiffs' technical expert identified several different devices and methods that could be used to perform the recognizing the number of lines function; and the remaining experts could not identify what structures were contained in Auto Line Number 30. Consequently, Defendants have established by clear and convincing evidence that one ordinarily skilled in the art would not understand the '385 Patent to disclose a particular structure corresponding to the means for recognizing the number of lines function.

Defendants having met their burden, the burden shifts to Plaintiffs to present evidence that a genuine issue of material fact exists. Plaintiffs have not met this burden. Plaintiffs have only the unsupported conclusions of Dr. von Herzen, which sometimes even contradict his own statements, to support the contention that the '385 Patent is not indefinite. However, Dr. von Herzen's own statements, as set out above, indicate that the scope of the invention has not been set out with "reasonable certainty" and clarity, as required by the Supreme Court's *Nautilus* decision. Consequently, it is

ORDERED that:

1. Defendants' Combined Motion for Summary Judgment of Invalidity and Non-Infringement [DE-221] is GRANTED.

2. Plaintiffs' claims are DISMISSED with prejudice.

3. All pending motions in all three cases are DENIED as moot.

4. The Court will enter separate judgments in each case.

5. These cases are CLOSED.

DONE and ORDERED in Miami, Florida, this 25th day of June, 2014.

PATRICIA A. SEITZ
UNITED STATES DISTRICT JUDGE

cc: All Counsel of Record

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
Case No. 12-CV-80701-SEITZ(consolidated)

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ACER, INC., *et al.*,
Defendants.
_____/

CASE NO. 12-80694-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ASUS COMPUTER INTERNATIONAL, *et al.*,
Defendants.
_____/

Case No.:12-80697-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
TPV TECHNOLOGY LIMITED, *et al.*,
Defendants.
_____/

Case No.:12-80701-CIV-SEITZ

AMENDED ORDER GRANTING DEFENDANTS' MOTION FOR SUMMARY JUDGMENT[1]

THIS MATTER is before the Court on the Defendants' Combined Motion for Summary Judgment of Invalidity and Non-Infringement [DE-221].[2] Plaintiffs allege that Defendants have infringed on their patent, U.S. Patent No. 5,349,385 (the '385 Patent), which is for an adaptive

[1]The original order omitted Appendix A, referred to on page 3 of the Order. No other changes have been made.

[2]While the Motion for Summary Judgment was filed by the defendants in all three cases, it was only docketed in Case No. 12-80701. All record citations are to the docket in Case No. 12-80701-CIV.

scan converter that converts different input formats to a fixed output format for display on screens, such as computer monitors or televisions. Defendants move for summary judgment on three grounds: (1) the '385 Patent's claims are indefinite under 35 U.S.C. § 112(b); (2) the accused products do not infringe as a matter of law; and (3) the prior art anticipates and renders the '385 Patent obvious.

Having considered the parties' submissions and all the record evidence, in the light most favorable to the non-moving party, the Court will grant Defendants' motion for summary judgment. Defendants have established by clear and convincing evidence that the '385 Patent is indefinite and, therefore, invalid because it does not clearly link corresponding structure to the "means for recognizing the number of lines in said [input/first[3]] format." Plaintiffs have not rebutted Defendants' evidence because they have not shown that one of ordinary skill in the art would know what specific structures perform the means for recognizing function set out in the Patent. Because the '385 Patent does not inform "with reasonable certainty, those skilled in the art about the scope of the invention," the Patent is invalid. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. – , 134 S. Ct. 2120, 2124 (2014)

I. Undisputed Material Facts

A. The Patent

Plaintiffs hold U.S. Patent No. 5,349,385.[4] The invention can convert any of several

[3]The parties agree that the terms "input format" and "first format" are essentially interchangeable in the '385 Patent.

[4]The patent application was filed in 1992 and the Patent issued in 1994. The record does not disclose whether the Patent was ever reduced to practice, licensed, or otherwise widely produced and used.

input formats to a fixed output format for display on screens, such as computer monitors and televisions. While scan version technology had been in existence since the 1960s, the '385 Patent's novelty came from its ability to perform the conversion without storing an entire frame of information, as required by the prior art. The '385 Patent uses means-plus-function language, as permitted by 35 U.S.C. §112(f), for every limitation of all ten claims of the Patent, except for the preambles. In their Joint Claim Construction Statement [DE-85], the parties agreed that the specification discloses "Auto Line Number 30" as purported structure corresponding to 14 of the 34 limitations recited by the Patent. While the parties disagree whether Auto Line Number 30 discloses structures capable of performing the corresponding functions, they do agree that Auto Line Number 30 is the corresponding structure for, among other things: (1) the "means for recognizing the number of lines in said [input/first] format" (claims 1-10); (2) the "means [for] automatically deriving an interpolation ratio" (claims 1-10); and (3) the "means for comparing the number of lines in a current [input/first] signal with said stored interpolation ratios and responsively to a match deriving the [required interpolation ratio/interpolation required]" (claims 3, 5, 8, 10). Auto Line Number 30 is shown in Figure 1 of the specification, as part of a functional block diagram. In the Figure, Auto Line Number 30 is a box, with no internal circuitry or other structure shown. Figure 1 is set out in Appendix A.

The only structure explicitly set out in the Patent as part of Auto Line Number 30 is set out in the following sentence: "These ratios are stored in memory (RAM) embodied in block 30 and compared with the current input to create a match; this match determines the scan conversion routine." ('385 Patent, 3:52-55.) No other structure corresponding to Auto Line Number 30 is explicitly set out in the Patent.

B. The Experts and their Interpretations of Auto Line Number 30

Defendants first raised their invalidity contentions in their Preliminary Invalidity Contentions filed on March 15, 2013 [DE-63]. Because the Patent does not explicitly disclose structure associated with Auto Line Number 30, other than the RAM, the relevant evidence is the testimony and reports of those ordinarily skilled in the art. In this case, the parties have submitted the deposition testimony of the inventor of the '385 Patent, the deposition testimony of the manager of the laboratory in which the inventor worked at the time of the invention, and the deposition testimony of Plaintiffs' industry expert. Additionally, both sides have retained technology experts. The technology experts testified at the *Markman* hearing on September 20, 2013 and October 2, 2013. The parties have also submitted for consideration the February 24, 2014 Initial Validity Expert Report of Plaintiffs' technology expert, Dr. von Herzen; the February 3, 2014 Initial Infringement Report of Dr. von Herzen; the March 31, 2014 Declaration of Dr. von Herzen; the February 24, 2014 Expert Report of Defendants' technology expert, Dr. Reader; and the March 17, 2014 Declaration of Dr. Reader.

1. The Inventor

The inventor of the patented invention, Dr. William Glenn, testified that a person could not just go into Radio Shack and buy an Auto Line Number 30 circuit, that he did not know whether one could find an Auto Line Number 30 on a specification sheet from a manufacturer, and that he did not recall ever hearing the term outside the context of the Patent. (Glenn Dep.[5] 211:21-212:2; 212:13-20.) When asked if he knew of a circuit that could perform the function of recognizing the number of lines in said input format, Dr. Glenn testified that "there are several

[5]Portions of the Glenn Deposition are filed at DE-224-32 and DE-224-33.

possible circuits that could do that." (*Id.* at 216:22-217:5.) In response to the question of whether he knew what circuit would be used for recognizing the number of lines in an input signal, Dr. Glenn responded, "Not really, you would have to figure out what the circuit signal would be." (*Id.* at 219:9-20.) Dr. Glenn's deposition was taken over several days. He testified that between days, he read the Patent. (*Id.* at 467:8-10.) Despite reviewing the Patent, Dr. Glenn stated that he did not find any more information about what Auto Line Number 30 is. (*Id.* at 468:17-23.)

2. The Markman Hearing

The first expert discussion of the structure of Auto Line Number 30 was at the *Markman* hearing on September 20 and continued on October 2, 2013. Plaintiffs' expert, Dr. Brain von Herzen, stated that Auto Line Number 30 was a "digital state machine," which meant a digital circuit that "can take several inputs, stores information in memory, and generates an output." (DE-109: 31:7-17.) Later in the *Markman* hearing, Dr. von Herzen testified that:

> It's my understanding that a sync signals, a plurality of sync signals, can be used to do the recognition. So that's one way that it can be done. It could be done, for example, by counting. It could be done, for example, by timing. The time differences between the sync signals, for example, the time between the horizontal syncs and the time and the number . . . sync signals are an example of how you can measure the number of lines.

(DE-130, 29:13-25.) He continued:

> Furthermore, there are other features -- I mean, the sync signals are examples that are specifically cited here about the features that can be counted. In addition, you can be looking at horizontal features such as the front porch or the back porch of a horizontal scan line or a vertical retrace interval, could be other properties that could be measured to those who have skill in the art and these are ways of measuring the input signal and recognizing numbers of lines. It's not explicitly talked about so much in this patent, but this is a set of examples of what could be used to recognize the number of lines.

(DE-130, 30:16-31.) At the *Markman* hearing Defendants' expert, Dr. Clifford Reader, in

response to the Court's question, "So you are saying that in the auto line, it is a little computer doing counting or –," stated that Auto Line Number 30 contains "some element that counts." (DE-130, 47:9-11.)

3. The Expert Reports and Declarations

In his February 3, 2014 Initial Infringement Expert Report, Dr. von Herzen stated that Auto Line Number 30 is the corresponding structure for the function "recognizing the number of lines in said input format" and that "a recognizing component (*e.g.*, a counter, a timer, *etc.*) of the Auto Line Number circuit 30 would perform this function." (DE-224-10 at 4.) In the same report, Dr. von Herzen refers to the "recognizing" function as being performed by "a counter component (or equivalent timing component) . . ." (*Id.* at 5.) Dr. von Herzen further states that "a software implementation of the structural components was available at the time of issuance of the ['385] Patent." (*Id.* at 6.) Later, in his February 24, 2014 Initial Validity Expert Report, Dr. von Herzen states that one ordinarily skilled in the art would know that the structure corresponding to the "means for recognizing" is "a counter." (DE-224-1 at 50.) In the same Validity Report, Dr. von Herzen states that three earlier patents do not disclose a means for recognizing the number of lines. (DE-224-2 at 43-44; 56; DE-224-3 at 3-4.) However, in his later Declaration, Dr. von Herzen states that the same three patents *disclose* "the same counter of known structure that is disclosed in the ['385] Patent to a person of ordinary skill in the art." (DE-248 at ¶¶16-18.)

In his Declaration in Support of Summary Judgment, Defendants' expert, Dr. Reader states that "'Auto Line Number 30' is not something well-known in the art that performs a common electrical function." (DE-223 at 8.) Dr. Reader further states that a person of ordinary

skill in the art would not know from reading the Patent to employ a "digital state machine" to achieve the claimed functionality of recognizing the number of lines. (*Id.* at 10.) At his deposition, Dr. Reader stated that "a counter is one possible way to do that." (DE-203, 139:1-2.) However, the context of that statement is not clear because of the redaction of the transcript that was filed with the Court.

4. Others Skilled in the Art

While not offered as technical experts, two other witnesses testified at their deposition that they did not know what Auto Line Number 30 is. John Marcinka, Dr. Glenn's laboratory manager at the time of the invention, was shown the '385 Patent and asked if he knew what the Auto Line Number 30 box in the figure was and he replied "no." (Marcinka Dep.[6] 77:21-25.)[7] Similarly, Plaintiffs' industry expert, Dr. Frederic Kahn also stated that he did not know what was inside the box shown as Auto Line Number 30. (Kahn Dep.[8] 26:5-16; 39:7-11.) Later, Dr. Kahn testified that the Patent disclosed a counter (*id.* at 108:8-20), but when questioned further he was unable to identify where the Patent identifies a "counter" (*id.* at108:21-109:23). At his deposition, Dr. Kahn stated that he was someone with "45 years of knowledge and study preceded by university studies that are relevant – directly relevant." (*Id.* at 27:6-8.)

II. Discussion

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[6]An excerpt of the Marcinka deposition is filed at DE-224-27.

[7]Plaintiffs later filed the Declaration of John W. Marcinka [DE-242], in which Marcinka directly addresses this statement given during his deposition. However, by separate order the Court struck the Declaration [DE-299]. Thus, only Marcinka's deposition testimony remains part of the record before the Court.

[8]Portions of the Kahn deposition are filed at 224-29.

A. The Indefiniteness Standard

Neither side disputes that the claims at issue are means-plus-function claims. As this Court previously stated in the Order re: Claims Construction [DE-151], means-plus-function claims are permitted under 35 U.S.C. § 112(f). Under § 112(f), formerly section 112, paragraph 6, "an element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts *described in the specification* and equivalents thereof." (emphasis added). The Federal Circuit has explained:

> The duty of a patentee to clearly link or associate structure with the claimed function is the quid pro quo for allowing the patentee to express the claim in terms of function under section 112, paragraph 6. *Budde v. Harley-Davidson, Inc.*, 250 F.3d 1369, 1377 (Fed. Cir. 2001). Section 112, paragraph 6 was intended to allow the use of means expressions in patent claims without requiring the patentee to recite in the claims all possible structures that could be used as means in the claimed apparatus. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583 (Fed. Cir. 1997). However, "[t]he price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof." *Id.* **If the specification is not clear as to the structure that the patentee intends to correspond to the claimed function, then the patentee has not paid that price but is rather attempting to claim in functional terms unbounded by any reference to structure in the specification**. Such is impermissible under the statute.

Medical Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1211 (Fed. Cir. 2003) (emphasis added). Thus, if a patent does not clearly disclose the structure for a means-plus-function term, the claim is indefinite. *Ergo Licensing, LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363 (Fed. Cir. 2012).

Further, §112(b) sets out the general standard for definiteness: "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention." The Supreme Court

recently addressed the definiteness requirement of § 112(b) in *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. –, 134 S. Ct. 2120 (2013). In *Nautilus*, the Court emphasized the importance of clarity in the specification, stating that "a patent's claims, viewed in light of the specification and prosecution history, [must] inform those skilled in the art about the scope of the invention with reasonable certainty. The definiteness requirement . . . mandates clarity, while recognizing that absolute precision is unattainable." *Id.* at 2129.[9]

While the understanding of one skilled in the art in no way relieves the patentee of adequately disclosing sufficient structure in the specification, interpretation of what is disclosed must be made in light of the knowledge of one skilled in the art. *Atmel Corp. v. Information Storage Devices, Inc.*, 198 F.3d 1374, 1380 (Fed. Cir. 1999). Thus, a "proper indefiniteness analysis asks first whether structure *is* described *in the specification*, and, if so, whether one skilled in the art would identify the structure from the description." *Biomedino, LLC v. Waters Technologies Corp.*, 490 F. 3d 946, 952 (Fed. Cir. 2007) (internal quotations omitted) (first emphasis in original; second emphasis added). Accordingly, the dispositive inquiry is whether one of ordinary skill in the art would understand the written description itself to disclose a structure, not simply whether such a person, reading the specification, would be capable of implementing a structure to perform the function. *Id.* at 953. Thus, "a bare statement that known

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[9]This standard differs from the one relied on by Plaintiffs in their opposition to the motion. Plaintiffs cite to *Exxon Research & Engineering Co. v. United States*, 265 F.3d 1371, 1375 (Fed. Cir. 2001), for the standard set out therein:

> If the meaning of the claim is discernible, even though the task may be formidable and the conclusion may be one over which reasonable persons will disagree, we have held the claim sufficiently clear to avoid invalidity on indefiniteness grounds.

The *Nautilus* decision has clearly rejected this looser standard of definiteness.

techniques or methods can be used does not disclose structure." *Id.*

Neither side disputes that a party that seeks a finding of indefiniteness, must establish that the patent is indefinite by clear and convincing evidence. *See TecSec, Inc. v. International Business Machines Corp.*, 731 F.3d 1336, 1349 (Fed. Cir. 2013). Further, whether a patent is indefinite is a matter of law and, thus, appropriate for summary judgment. *Ancora Technologies, Inc. v. Apple, Inc.*, 744 F.3d 732, 734 (Fed. Cir. 2014).

B. The '385 Patent is Indefinite

Defendants' indefiniteness position is that the '385 Patent does not disclose any structure, other than a memory, corresponding to Auto Line Number 30 and its agreed functions of: (1) "recognizing the number of lines in said [input/first] format;" (2) "automatically deriving an interpolation ratio;" and (3) "comparing the number of lines in a current [input/first] signal with said stored interpolation ratios and responsively to a match deriving the [required interpolation ratio/interpolation required]." Plaintiffs, on the other hand, maintain that a person of ordinary skill in the art, reading the claims and specification, would recognize known structures and, therefore, under the controlling case law, the claims are not indefinite. Because the Patent is indefinite as to the corresponding structure for the "means for recognizing the number of lines in said [input/first] format" function, the Patent is invalid.[10]

The means-plus-function claim of "means for recognizing the number of lines in said

[10]While the Court need not determine whether the Patent is also indefinite as to the other two functions associated with Auto Line Number 30, the Court finds that the Patent is also indefinite as to these functions because there is no clearly identifiable structure associated with the means for deriving and the means for comparing. Further, the expert testimony presented by the parties indicates that one skilled in the art would be able to identify multiple structures that could perform the functions at issue. Thus, the '385 has not identified the structure corresponding to these two function with reasonable certainty.

[input/first] format" is used in all 10 of the numbered claims of the Patent. As previously stated, the parties agree that the structure corresponding to this claim is Auto Line Number 30. However, Defendants assert that Auto Line Number 30 is not an actual structure that could perform the corresponding function because neither the specification nor the Figures contain an explicit description of any actual structure associated with the means for recognizing function. Because this claim is used in all 10 claims of the '385 Patent, if the Patent does not disclose corresponding structure for Auto Line Number 30, the entire Patent would be invalid for indefiniteness.

The text of the specification sets out only one structure associated with Auto Line Number 30 - "memory (RAM) embodied in block 30" - and neither side argues that this structure is associated with the means for recognizing the number of lines. Defendants assert, and Plaintiffs have not argued otherwise, that an "Auto Line Number" circuit is not a term known to persons of ordinary skill in the art outside of the context of the '385 Patent. Defendants further assert, and the undisputed evidence supports the assertion, that an "Auto Line Number" circuit is not off-the-shelf hardware or software and there are several possible structures that could perform the functions of "Auto Line Number 30." Plaintiffs do not dispute that no additional structure, beyond memory, is explicitly disclosed in the claims, specification, or figures. Plaintiffs rely on their expert to contend that a person of ordinary skill in the art would know, based on the specification, that "Auto Line Number 30" includes, among other things, a counter.[11]

[11]Plaintiffs also contend that Auto Line Number 30 includes a divider circuit, a look-up table associated with memory, and a difference comparator. However, none of these structures are relevant to the means for recognizing the number of lines. Moreover, none of these structures

Neither side disputes that, at its core, the function of the "means for recognizing the number of lines" is to count the number of lines in the input format. The Defendants argue that the '385 Patent does not disclose any structure corresponding to this function. Plaintiffs implicitly concede that the '385 Patent does not explicitly disclose any structure corresponding to the means for recognizing the number of lines but maintain that a person of ordinary skill in the art would know that the corresponding structure is a "counter," with a well-known structure at the time. However, Plaintiffs' expert, Dr. von Herzen, in his Initial Infringement Expert Report, states that "one skilled in the art would understand that a recognizing component (*e.g.*, a counter, a timer, *etc.*)" would perform the function of recognizing the number of lines. At the *Markman* hearing Dr. von Herzen stated that Auto Line Number 30 was a "digital state machine," which meant a digital circuit that "can take several inputs, stores information in memory, and generates an output." Later at the *Markman* hearing, Dr. von Herzen testified that:

> It's my understanding that a sync signals, a plurality of sync signals, can be used to do the recognition. So that's one way that it can be done. *It could be done, for example, by counting. It could be done, for example, by timing.* The time differences between the sync signals, for example, the time between the horizontal syncs and the time and the number . . . sync signals are *an example of how you can measure the number of lines.*

(emphasis added). He continued:

> Furthermore, there are other features -- I mean, the sync signals are examples that are specifically cited here about the features that can be counted. In addition, you can be looking at horizontal features such as the front porch or the back porch of a horizontal scan line or a vertical retrace interval, could be other properties that could be measured to those who have skill in the art and these are ways of measuring the input signal and recognizing numbers of lines. *It's not explicitly talked about so much in this patent, but this is a set of examples of what could be used to recognize the number of lines.*

(emphasis added). Thus, Plaintiffs' expert has offered several possible ways of achieving the

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are set out in the specification or claims.

function of counting – a counter, a timer, or a digital state machine – and has offered different features, or properties, that could be counted to recognize the number of lines. Further, Dr. von Herzen noted that the Patent does not explicitly discuss how the counting is done or what features, or properties, are counted. Noticeably, at the *Markman* hearing, Dr. von Herzen did not say that it was clear from the Patent what was counted or exactly how it was counted.

Plaintiffs argue that, at the *Markman* hearing, Defendants' expert admitted that the Patent discloses a counter, as Plaintiffs now assert. However, a careful reading of Dr. Reader's testimony indicates that Dr. Reader agreed that the function was counting the number of lines but he never stated that the counting was done via a counter, timer, or digital state machine. When asked by the Court at the *Markman* hearing whether there was a little computer doing the counting, Dr. Reader replied, "There is *some element* that counts, yes." (emphasis added). Thus, contrary to Plaintiffs' assertions, Dr. Reader never stated that the '385 Patent discloses a counter as the means by which the counting function is performed; instead, Dr. Reader simply recognized that something had to do the counting.

Plaintiffs further argue that based on the testimony of Dr. Reader and Dr. von Herzen, it is clear that a person of ordinary skill in the art would understand the presence of a counter based on the '385 Patent's specification. Consequently, Plaintiffs maintain that the Patent is not indefinite. Contrary to Plaintiffs' assertions, neither expert has definitely said that a person of ordinary skill in the art would read the patent and come to the conclusion that one specific type of known counter was disclosed by the patent. Thus, the evidence indicates that the specification does not disclose a structure for counting; instead, a person of ordinary skill in the art would be able to implement a structure that could count. That, however, is not the standard. As set out in

Biomedino, the question is whether a person of ordinary skill in the art would be able to identify from the specification a structure that could count, not whether the person would be able to come up with a structure on his own that could perform the function. Consequently, the '385 Patent is indefinite as to the structure associated with the means for recognizing the number of lines. Because a means for recognizing the number of lines is a part of every claim, the '385 Patent is invalid.

Plaintiffs' reliance on *Telcordia Technologies, Inc. v. Cisco Systems, Inc.*, 612 F.3d 1365 (Fed. Cir. 2010), to support their contention that the absence of internal circuitry in the written description does not render the means for recognizing the number of lines indefinite, is misplaced. While *Telcordia* did find that the absence of internal circuitry does not necessarily render a claim indefinite, in *Telecordia* the evidence established that a person ordinarily skilled in the art would know how to interpret the specification and actually build the circuit at issue. *Id.* at 1377. Such is not the case here, not only is there no consensus among the skilled artisans who testified, Plaintiffs' own expert testified at the *Markman* hearing that multiple types of devices could have been used to perform the counting function and that there are multiple methods of counting. Thus, in this case, the specification has not disclosed "adequate defining structure to render the bounds of the claim understandable to an ordinary artisan." *Id.* As the Federal Circuit has previously stated, "[t]hat ordinary skilled artisans could carry out the recited function in a variety of ways is precisely why claims written in 'means-plus-function' form must disclose the particular structure that is used to perform the recited function." *Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1385 (Fed. Cir. 2009). Here, the patentee simply did not meet the requirements of means-plus-function claiming.

II. Conclusion

As the moving parties, the burden is on Defendants to present clear and convincing evidence that the '385 Patent is indefinite. Defendants have met this burden by establishing that: there is no structure explicitly set out in the Patent corresponding to the means for recognizing the number of lines function; the inventor, after reviewing the Patent, could not identify what structure corresponds to this function and testified that "several possible circuits" could perform the function; Plaintiffs' technical expert identified several different devices and methods that could be used to perform the recognizing the number of lines function; and the remaining experts could not identify what structures were contained in Auto Line Number 30. Consequently, Defendants have established by clear and convincing evidence that one ordinarily skilled in the art would not understand the '385 Patent to disclose a particular structure corresponding to the means for recognizing the number of lines function.

Defendants having met their burden, the burden shifts to Plaintiffs to present evidence that a genuine issue of material fact exists. Plaintiffs have not met this burden. Plaintiffs have only the unsupported conclusions of Dr. von Herzen, which sometimes even contradict his own statements, to support the contention that the '385 Patent is not indefinite. However, Dr. von Herzen's own statements, as set out above, indicate that the scope of the invention has not been set out with "reasonable certainty" and clarity, as required by the Supreme Court's *Nautilus* decision. Consequently, it is

ORDERED that:

1. Defendants' Combined Motion for Summary Judgment of Invalidity and Non-Infringement [DE-221] is GRANTED.

2. Plaintiffs' claims are DISMISSED with prejudice.

3. All pending motions in all three cases are DENIED as moot.

4. The Court will enter separate judgments in each case.

5. These cases are CLOSED.

DONE and ORDERED in Miami, Florida, this 30th day of June, 2014.

PATRICIA A. SEITZ
UNITED STATES DISTRICT JUDGE

cc: All Counsel of Record

Case: 15-1125 Document: 40 Page: 76 Filed: 01/13/2015

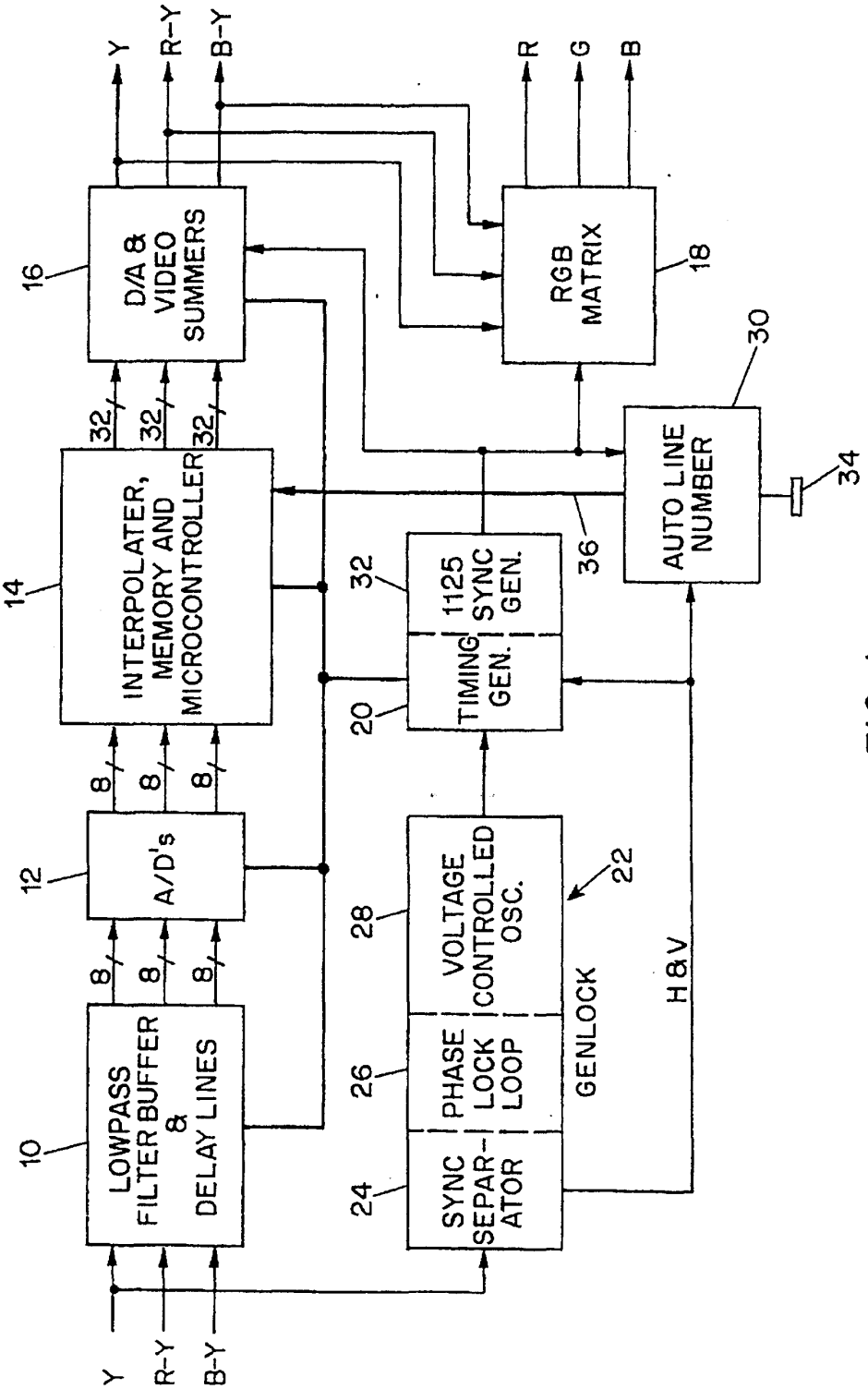

FIG. 1

Appendix A

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
Case No.:12-80701-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY
RESEARCH CORPORATION and
DOMAINE ASSOCIATES, LLC,

Plaintiffs,

v.

TPV TECHNOLOGY LOMITED, et al.,

Defendants.
_____/

FINAL JUDGMENT

The Court having granted Defendants' Motion for Summary Judgment on June 24, 2014, it is hereby:

ORDERED that judgment is entered in favor of the Defendants, TPV Technology Limited, Top Victory International Limited, Top Victory Electronics (Fujian) Co. Ltd., Top Victory Electronics (Taiwan) Co., Ltd., TPV Electronics (Fujian) Co., Ltd., TPV International (USA), Inc., Envision Peripherals, Inc., and AOC International, and against Plaintiffs, Florida Atlantic University Research Corporation and Domaine Associates, LLC. Plaintiffs shall recover nothing and their claims are dismissed on the merits.

DONE and ORDERED in Miami, Florida, this 25th day of June, 2014.

Patricia A. Seitz

PATRICIA A. SEITZ
UNITED STATES DISTRICT JUDGE

cc: All Counsel of Record

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA
Case No. 12-CV-80701-SEITZ(consolidated)

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ACER, INC., *et al.*,
Defendants.
_____/

CASE NO. 12-80694-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
ASUS COMPUTER INTERNATIONAL, *et al.*,
Defendants.
_____/

Case No.:12-80697-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

v.
TPV TECHNOLOGY LIMITED, *et al.*,
Defendants.
_____/

Case No.:12-80701-CIV-SEITZ

ORDER DENYING MOTION FOR RECONSIDERATION AND MOTION FOR ORAL ARGUMENT

THIS MATTER is before the Court on Plaintiffs' Motion for Reconsideration of the Court's Order Granting Summary Judgment on Indefiniteness and to Alter or Amend the Judgment By Vacating It [DE-308] and the Plaintiffs' Request for Oral Argument [DE-309].[1] Defendants have filed a response and Plaintiffs have filed a reply to the Motion for

[1]The Motion for Reconsideration is DE-270 in Case No. 12-80694 and DE-272 in Case No. 12-80697. The Motion for Oral Argument is DE-271 in Case No. 12-80694 and DE-273 in Case No. 12-80697.

Reconsideration. The Court's Amended Order Granting Defendants' Motion for Summary Judgment found that Plaintiffs' patent, U.S. Patent No. 5,349,385 (the '385 Patent or the Patent), for an adaptive scan converter, is indefinite under 35 U.S.C. § 112(b) because it does not clearly link corresponding structure to the "means for recognizing the number of lines in said [input/first[2]] format."

This claim is a means-plus-function claim. Therefore, as previously stated by the Court, the dispositive inquiry for indefiniteness is whether one of ordinary skill in the art would understand the written description itself to disclose a structure, not simply whether such a person, reading the specification, would be capable of implementing a structure to perform the function. *See* DE-303 at 9 (citing *Biomedino, LLC v. Waters Technologies Corp.*, 490 F.3d 946, 952 (Fed. Cir. 2007)). At times, Plaintiffs seem to conflate function and structure. There is no question as to the function of the disputed claim – counting the number of horizontal lines. However, means-plus-function claiming requires an identifiable structure for carrying out that function. Here, Plaintiffs have not shown that the Court erred in finding that the '385 Patent does not disclose such a structure. Because Plaintiffs have not met their burden for reconsideration, the motions are denied.

I. Reconsideration Standard

Reconsideration of an order "is an extraordinary remedy to be employed sparingly." *Burger King Corp. v. Ashland Equities, Inc.*, 181 F. Supp. 2d 1366, 1370 (S.D. Fla. 2002). There are three grounds for reconsideration: (1) an intervening change in controlling law; (2) the

[2]The parties agree that the terms "input format" and "first format" are essentially interchangeable in the '385 Patent.

availability of new evidence; and (3) the need to correct clear error or prevent manifest injustice. *Id.* at 1369. In order to demonstrate clear error, a plaintiff must do more than simply restate previous arguments. *Bautista v. Cruise Ships Catering & Service Intern'l, N.V.*, 350 F. Supp. 2d 987, 992 (S.D. Fla. 2003).

> It is an improper use of the motion to reconsider to ask the Court to rethink what the Court . . . already thought through-rightly or wrongly . . .. The motion to reconsider would be appropriate where, for example, the Court has patently misunderstood a party, or has made a decision outside the adversarial issues presented to the Court by the parties, or has made an error not of reasoning but of apprehension.

Z.K. Marine Inc. v. M/V Archigetis, 808 F. Supp. 1561, 1563 (S.D. Fla. 1992) (citations omitted and brackets omitted). Thus, a "motion for reconsideration cannot be used to re-litigate old matters, raise argument or present evidence that could have been raised prior to the entry of the [challenged order]. This prohibition includes new arguments that were previously available, but not pressed." *Wilchombe* v. *Teevee Toons, Inc.*, 555 F.3d 949, 957 (11th Cir. 2009) (internal quotations and citations omitted).

II. Discussion

Plaintiffs' argue that the Court erred in finding the '385 Patent indefinite because the Court improperly based its decision on evidence regarding infringement, when it should only have looked to the Patent to determine the structure disclosed to a person of ordinary skill in the art. Defendants oppose the motion on its merits and because it reiterates arguments previously made and rejected by the Court. This latter reason alone is sufficient to deny the motion. While Plaintiffs attempt to argue that the Court's error was one of "apprehension," not one of reasoning, in this case, this distinction is one of semantics, not substance, and is nothing more than an attempt to get around the high standard for reconsideration. Nonetheless, the motion should also

be denied on its merits.

Plaintiffs assert that both experts unequivocally testified that the '385 Patent discloses a counter, despite no mention of one in the written specifications, and that a person of ordinary skill in the art would know the structure of that counter. Plaintiffs point to Figure 1 of the '385 Patent to support this theory. In Figure 1 of the Patent, the relevant portion of which is set out below, both the H sync and the V sync signals enter Auto Line Number 30.

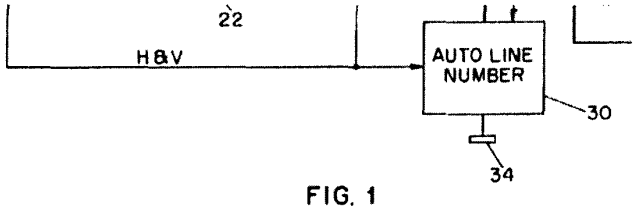

FIG. 1

According to Plaintiffs, this Figure indicates that the *only* role for the H sync and V sync signals is to cause the counter inside Auto Line Number 30 to count the H sync pulses and reset the count on the V sync pulse. Plaintiffs assert that a person of ordinary skill in the art would *immediately* recognize the structure disclosed, as part of Auto Line Number 30, to be something that counts pulses, despite the absence of any actual structure in the specifications or the Figure. However, Plaintiffs' own expert testified at the *Markman* hearing that the counting could be done in, at least, two ways using the sync signals: using a counter to count the H sync pulses or timing the differences between the sync signals to count the H sync pulses. (DE-130 at 29:13-18.) Thus, while both experts testified at the *Markman* hearing that it was necessary to count the H sync pulses, at the hearing, neither one definitively stated that the Patent makes it clear that the

counting must be done by a counter, as opposed to a timer, or other device. In other words, both experts agreed on the function (counting sync pulses) but neither definitely stated what the disclosed corresponding structure was.

Plaintiffs argue that all of the evidence supports only one conclusion: the '385 Patent discloses a counter of known structure to a person of ordinary skill in the art. The evidence, however, is not nearly that definitive. While Plaintiffs' expert later stated in his Validity Report that the corresponding structure is a counter that increments on each H sync and resets on a V sync, he was not that definitive at the *Markman* hearing. Further, while Defendants' expert recognized that the Patent discloses that the H sync signals must be counted, he repeatedly stated the Patent does not disclose the exact structure or means for counting. Moreover, other witnesses, who would qualify as persons of ordinary skill in the art, when asked about Auto Line Number 30, were unable to identify a counter, let alone a specific counter of known structure. Dr. William Glenn, the inventor of the Patent, after having had time to review the Patent, stated that there were "several possible circuits that could [recognize the number of lines]." (Glenn Dep. 216:22-217:5.) John Marcinka, Dr. Glenn's laboratory manager at the time of the invention, stated that he did not know what the Auto Line Number 30 box was. (Marcinka Dep. 77:21-25.) Dr. Frederic Kahn also stated that he did not know what was inside the Auto Line Number 30 box. (Kahn Dep. 26:5-16; 39:7-11.) It is undisputed that all of these people would qualify as a person of ordinary skill in the art. Yet, they were unable to identify the counter that Plaintiffs assert would be "immediately" recognizable to such a person. Thus, contrary to Plaintiffs' contentions, the '385 Patent does not clearly disclose a counter of known structure.

Plaintiffs further contend that the Court erroneously conflated the testimony and opinions

related to indefiniteness and the testimony and opinions related to infringement. First, the Court notes that any testimony given at the *Markman* hearing was solely for the purpose of construing the claims. Thus, when Plaintiffs' expert testified at the *Markman* hearing, as set out above, that the number of lines could be recognized by using a counter or timer, he was testifying only about how to construe the claims, not about possible equivalents of the claims. Further, despite Plaintiffs' contentions otherwise, portions of their expert's Infringement Report did directly address the Patent, not just the equivalent structures. Specifically, the language quoted by Plaintiffs in their motion starts by stating that "I now consider the specific elements recited in claim 1." Thus, contrary to Plaintiffs' assertion, the Court's reliance on portions of the Invalidity Report for purposes of claim construction was not misguided and did not result in the conflation of claims construction and invalidity. Accordingly, it is

ORDERED that:

1. Plaintiffs' Motion for Reconsideration of the Court's Order Granting Summary Judgment on Indefiniteness and to Alter or Amend the Judgment By Vacating It [DE-308 in Case No. 12-80701; DE-270 in Case No. 12-80694; and DE-272 in Case No. 12-80697] is DENIED.

2. Plaintiffs' Request for Oral Argument [DE-309 in Case No. 12-80701, DE-271 in Case No. 12-80694; and DE-273 in Case No. 12-80697] is DENIED.

DONE and ORDERED in Miami, Florida, this 3rd day of October, 2014.

PATRICIA A. SEITZ
UNITED STATES DISTRICT JUDGE

cc: All Counsel of Record

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF FLORIDA

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION, *et al.*,
Plaintiffs,

vs.
ACER, INC., *et al.*,
Defendants.
_____/

CASE NO. 12-80694-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION and DOMAINE ASSOCIATES, LLC,
Plaintiffs,

v.
ASUS COMPUTER INTERNATIONAL and ASUSTEK COMPUTER, INC.,
Defendants.
_____/

Case No.:12-80697-CIV-SEITZ

FLORIDA ATLANTIC UNIVERSITY RESEARCH CORPORATION and DOMAINE ASSOCIATES, LLC,
Plaintiffs,

v.

TPV TECHNOLOGY LIMITED, *et al.*,
Defendants.
_____/

Case No.:12-80701-CIV-SEITZ

ORDER GRANTING DEFENDANTS' MOTION TO STRIKE THE DECLARATION OF JOHN W. MARCINKA

THIS CAUSE came before the Court on Defendants' Motion to Strike the Declaration of John W. Marcinka because it is an expert opinion and Plaintiffs did not disclose Mr. Marcinka as an expert pursuant to Fed. R. Civ. P. 26. [1] [DE 231].[2] Plaintiffs filed the Declaration of John W.

[1] Alternatively, Defendants seek to have the Court strike the declaration as a "sham affidavit" because Marcinka's declaration is inapposite to his previous deposition testimony. Because the Court will strike the Marcinka

Marcinka [DE 202] ("the Marcinka Declaration") as part of their Opposition to Defendants' Motion for Summary Judgment [DE 205]. The twenty-three paragraph declaration sets forth the basis for Mr. Marcinka's opinion that the '385 patent taken as a whole enables him, as one ordinarily skilled in the art, to know that the figure at "Auto Line Number 30" of the claimed scan conversion device contains a counter, memory, and a comparator. As is relevant to the motion to strike, the thrust of Defendants' summary judgment motion is that claims of the '385 patent are invalid for indefiniteness. Plaintiffs' opposition cites the Marcinka Declaration (among other testimonial evidence) as record evidence to refute the indefiniteness challenge.

Having considered the motion, Plaintiffs' Opposition [DE 245], the Reply [DE 249], and the record, the Court will strike the Marcinka Declaration. Mr. Marcinka's declaration is expert testimony under Fed. R. Evid. 702 and Plaintiffs have not shown that their failure to timely disclose Mr. Marcinka as an expert witness was substantially justified or harmless.

I. BACKGROUND

John Marcinka worked for many years as assistant to the inventor of the '385 patent, Dr. William Glenn. However, it is undisputed that he did not collaborate with Dr. Glenn on developing the scan convertor taught by the '385 patent. [DE 230-6, 85:21-24]; [DE 230-1, 174 – 175]. Marcinka managed Dr. Glenn's research laboratory until Marcinka retired from FAU in 2008. He was retained by Plaintiffs' counsel as a consultant in this case.

On March 3, 2014, Plaintiffs listed Mr. Marcinka as a potential witness, indicating he had information "about the technology of the '385 patent," but Plaintiffs did not designate him as an expert witness nor did they produce an expert report from him on February 3, 2014. [DE 230-8, p.

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declaration due to Plaintiffs' non-compliance with Rule 26, Defendants' "sham affidavit" argument need not be reached.

[2] All record citations correspond to the docket in *Florida Atlantic University Research Corp., et. al. v. Acer, Inc., et. al.*, 12-80694-civ.

4]. Pursuant to the Court's amended Scheduling Order, all initial expert disclosures were to have occurred no later than February 3, 2014 and expert discovery completed by March 14, 2014. [DE 157, p. 3]. While Defendants learned of Mr. Marcinka as a potential fact witness in May 2013 and deposed him in December 2013, Mr. Marcinka's conclusions about the components of Auto Line Number 30, discussed below, were set forth for the first time in his declaration, filed after the close of discovery.[3]

The first two sections of the declaration lay out the facts to support the claim that Mr. Marcinka is one ordinarily skilled in the subject matter of the Glenn Patent. Section one sets out Mr. Marcinka's approximately forty-eight years of experience in the field of video signal processing and circuit design and construction. It describes several of the projects he worked on in his career, incorporates his CV as an appendix and states that Mr. Marcinka is a paid consultant to Plaintiffs. [DE 202, ¶¶ 5 – 11].

The remaining sections contain the opinions relevant to the indefiniteness dispute.[4] Mr. Marcinka states that as one ordinarily skilled in the art, upon review of the Glenn patent, he knows that Auto Line Number 30 discloses a (i) counter to recognize the number of lines through synchronization signals [DE 202, ¶¶ 12 – 15], (ii) a memory to automatically derive an interpolation ratio [*Id.*, ¶¶ 16 – 20], and (iii) a comparator to compare the number of lines in the input format to the store rations in the memory [*Id.*, ¶¶ 21 – 23]. Plaintiffs cite the Marcinka Declaration as evidence

[3] Mr. Marcinka's inability to recognize Auto Line Number 30 at his deposition, despite his having reviewed the patent just before being deposed, is explained in his declaration where he states that he answered the question about Auto Line Number 30 only in reference to his having seen Figure 1 of the Glenn Patent and without reference to either the Patent's specification or claims. [DE 202, ¶¶ 9 – 10].

[4] The Federal Circuit describes the standard for indefiniteness as follows: "[the] standard is met where an accused infringer shows by clear and convincing evidence that a skilled artisan could not discern the boundaries of the claim based on the claim language, the specification, and the prosecution history, as well as [his] knowledge of the relevant art area." *Haliburton Energy Servs. Inc. v. M-I LLC,* 514 F.3d 1244, 1249-50 (Fed. Cir. 2008).

that "one ordinarily skilled in the art" knows that Auto Line Number 30 discloses three structures: (i) a counter; (ii) a memory; and (iii) a comparator of known structure.

II. ANALYSIS

In response to the motion to strike, Plaintiffs argue Mr. Marcinka's opinions are not expert opinions under Fed. R. Evid. 702 but simply lay opinions admissible under Fed. R. Evid. 701. Under Rule 701, lay opinions are only admissible when they are (a) rationally based on the witness's perceptions; (b) helpful to clearly understand the witness's testimony or determine a fact in issue; and (c) not based on scientific, technical, or other specialized knowledge within the scope of Rule 702. Rule 701 ensures, in part, that expert testimony is properly assessed for reliability under the Rule 702 mechanisms, thus preventing proponents of expert testimony from "proffering an expert in lay witness clothing." Fed. R. Evid. 701 Advisory Committee's Note (2000).

Mr. Marcinka's opinions regarding what he, as someone ordinarily skilled in the art, could glean upon the review of the '385 patent, are not Rule 701 lay opinions for two reasons. First, Mr. Marcinka's opinions about his understanding of what the '385 patent teaches are classic non-percipient witness testimony. Second, Mr. Marcinka's opinions, which he renders from the vantage of one ordinarily skilled in the arts of video display technology and circuit fabrication, are based on specialized technical knowledge and, to be admitted, must pass muster under the reliability-assessment framework of Rule 702 and *Daubert v. Merrill Dow Pharmaceuticals, Inc.* 509 U.S. 579 (1993).

i. Mr. Marcinka's Opinions Constitute Classic Non-Percipient Witness Testimony

Mr. Marcinka's declaration explains that his "views" are based on his knowledge and experience as one skilled in the art and his careful study of the Glenn patent after his deposition. Given that Mr. Marcinka did not base his opinions on knowledge obtained through percipient

observation, such as that which would occur during the patent's development, but rather, on his review of the issued patent and his skill in the art, the declaration opinions are not proper Rule 701 lay opinion testimony. *See United States v. Cano*, 289 F.3d 1354, 1365 (11th Cir. 2002) (explaining that where law enforcement agent merely drew inference based on facts already in evidence as opposed to providing facts based on his own perception, such testimony would be improper because agent "merely delivered a jury argument from the witness stand.") Allowing Mr. Marcinka's opinions to stand without either establishing their factual basis or subjecting them to reliability testing under Rule 702 would effectively enable Plaintiffs "to proffer an expert witness in lay clothing."

ii. Mr. Marcinka's Opinions Fall Within Rule 702

In his declaration, Mr. Marcinka states that as one "ordinarily skilled in the art" he is aware that certain known structures – a counter, memory, and comparator – are all present in Auto Line Number 30. "The distinction between lay and expert testimony is that lay testimony results from a process of reasoning familiar in everyday life, whereas expert testimony results from a process of reasoning that can only be mastered by specialists in the field." *See United States v. York*, 600 F.3d 347, 360 - 361 (5th Cir. 2010). Moreover, "as a general rule of thumb . . . 'expert testimony' [is] testimony that a witness prepares, as opposed to testimony of what a witness observes." *Hynix Semiconductor Inc. v. Rambus, Inc.*, No. C-00-20905 RMW, 2009 WL 230039 *11 (N.D. Cal. Jan. 27, 2009). Based on these criteria, Mr. Marcinka's opinions are quintessential expert testimony.

Mr. Marcinka reviewed a patent, in which he had no developmental involvement, drew on nearly 50 years of experience in the fields of circuit design and video display technology, and, from the vantage of "one ordinarily skilled in the art," rendered his opinions in a nine page affidavit. Mr. Marcinka can only opine that Auto Line Number 30 discloses a counter, memory, and a comparator because of his specialized experience in a technical field. As such, his opinions must be disclosed

under Fed. R. Civ. P. 26. *See Gomez v. Rivera Rodriguez*, 344 F.3d 103, 113 (1st Cir. 2003) ("[T]he triggering mechanism for application of Rule 26's expert witness requirements is not the status of the witness but the rather the essence of the proffered testimony.") Moreover, factoring into the analysis the fact that Mr. Marcinka's opinions are based on his review of a patent he first encountered as Plaintiffs' hired litigation consultant [DE 269-1, pp. 69 – 70], it is clear that Mr. Marcinka's opinions triggered Rule 26's disclosure requirement.[5]

Defendants have not cited any convincing authority for the proposition that testimony by one "ordinarily skilled in the art" could be admitted under Rule 701 where the witness was not involved in the patent's development.[6] Given that the review of patent claims is inherently technical, the proposed testimony is only be admissible under Rule 702.

iii. The Marcinka Declaration Must Be Stricken Pursuant to Fed. R. Civ. P. 37(c)(1)

Because Mr. Marcinka's declaration is expert testimony under Rule 702, Plaintiffs were obligated to disclose him as an expert under Fed. R. Civ. P. 26(a)(2) and to serve Defendants with his expert report by the February 3, 2014 amended disclosure deadline. [DE 157, p. 3]. Plaintiffs failed to do either and the time for so doing has expired. Under the Rules of Civil Procedure Plaintiffs cannot use the Marcinka Declaration unless they show that the failure to disclose was either substantially justified or harmless. Fed. R. Civ. P. 37(c)(1). Plaintiffs have made neither showing and the trial is around the corner. Thus, to allow Plaintiffs to add an undisclosed expert at this stage

[5] Plaintiffs charge Defendants with inviting Mr. Marcinka's expert opinions by questioning him at his deposition on certain structures present in the covered scan convertor. [DE 245, p. 2]. This argument is simply a veiled appeal to the equities, suggesting that since Defendants opened the door, Defendants should have to live with the consequences. The argument is unavailing and cannot excuse an ambush tactic in contravention of the Court's Order that experts had to be disclosed by February 3, 2014 consistent with Rule 26's report requirement.

[6] The lone Federal Circuit case Plaintiffs cite, *Union Pacific Resources Co. v. Chesapeake Energy Corp.*, 236 F.3d 684, 693 (Fed. Cir. 2001), contains just two paragraphs addressing the admissibility of specialized opinion testimony under Rule 701. Without meaningful analysis, it concludes only that the district court did not abuse its discretion in allowing testimony from eight witnesses who "may have testified based on their personal experiences."

when Defendants have not had the opportunity to depose him on those opinions or challenge the reliability of the opinions under *Daubert* would be inconsistent with both the Court's Order and the Rules of Civil Procedure. Accordingly, the declaration must be stricken. Therefore, it is

ORDERED THAT

(1) Defendants' Motion to Strike the Declaration of John W. Marcinka [DE 270] is **GRANTED.**

(2) The Declaration of John W. Marcinka [DE 202] is **STRICKEN.**

DONE AND ORDERED in Miami, Florida this 12th day of June, 2014.

PATRICIA A. SEITZ
UNITED STATES DISTRICT JUDGE

cc: Honorable William C. Turnoff
Counsel of Record

US005349385A

United States Patent [19]

Glenn

[11] Patent Number: 5,349,385

[45] Date of Patent: Sep. 20, 1994

[54] **ADAPTIVE SCAN CONVERTER**

[75] Inventor: **William E. Glenn**, Fort Lauderdale, Fla.

[73] Assignee: **Florida Atlantic University**, Boca Raton, Fla.

[21] Appl. No.: **926,587**

[22] Filed: **Aug. 6, 1992**

[51] **Int. Cl.**[5] **H04N 7/01**

[52] **U.S. Cl.** **348/458**; 348/445

[58] **Field of Search** 358/140, 11; 348/445, 348/458; H04N 7/01

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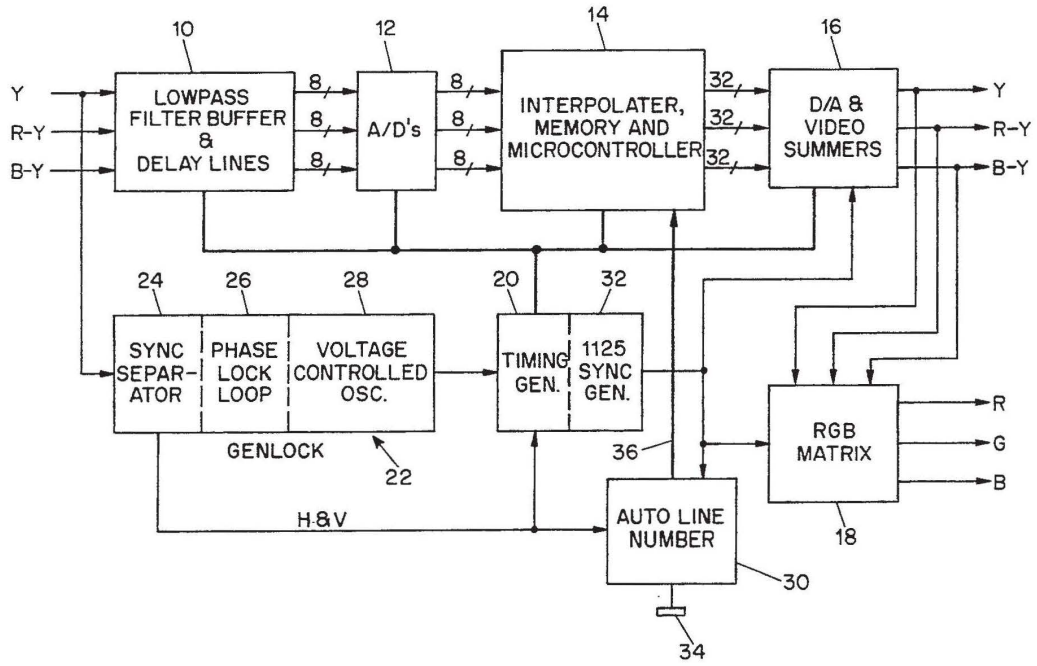
Primary Examiner—James J. Groody
Assistant Examiner—Glenton B. Burgess
Attorney, Agent, or Firm—Brumbaugh, Graves, Donohue & Raymond

[57] **ABSTRACT**

A scan converter capable of converting from any of several input scan formats to a fixed output format, which may or may not have the same number of lines as the input, derives a current displayed (output) field or frame by interpolation from the current field of an input whose vertical scan frequency is the same as that of the output. The converter recognizes the number of lines in the input and automatically derives the appropriate interpolation routine to make the conversion to a desired fixed output format. Because the vertical scan frequency is the same for the input and output, only a few lines of storage, instead of the frame store usually required, are needed to accomplish conversion with results comparable to that attainable when a full frame of information is stored.

10 Claims, 3 Drawing Sheets



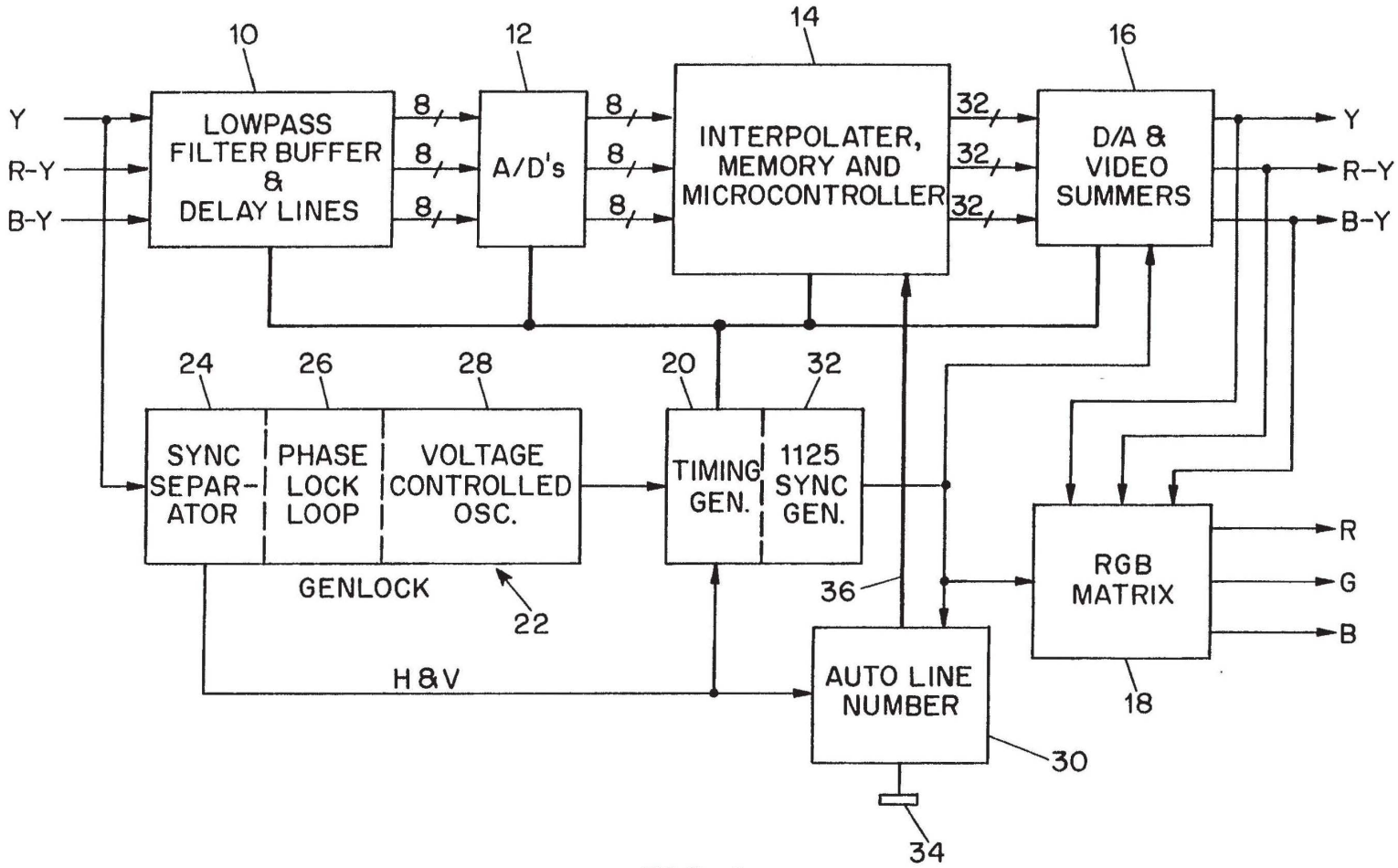

Y
R-Y
B-Y
10
LOWPASS FILTER BUFFER & DELAY LINES
8
8
8
12
A/D's
8
8
8
14
INTERPOLATER, MEMORY AND MICROCONTROLLER
32
32
32
16
D/A & VIDEO SUMMERS
Y
R-Y
B-Y
24
SYNC SEPAR-ATOR
26
PHASE LOCK LOOP
28
VOLTAGE CONTROLLED OSC.
GENLOCK
22
20
TIMING GEN.
32
1125 SYNC GEN.
36
RGB MATRIX
R
G
B
18
H&V
AUTO LINE NUMBER
30
34

FIG. 1

A0098

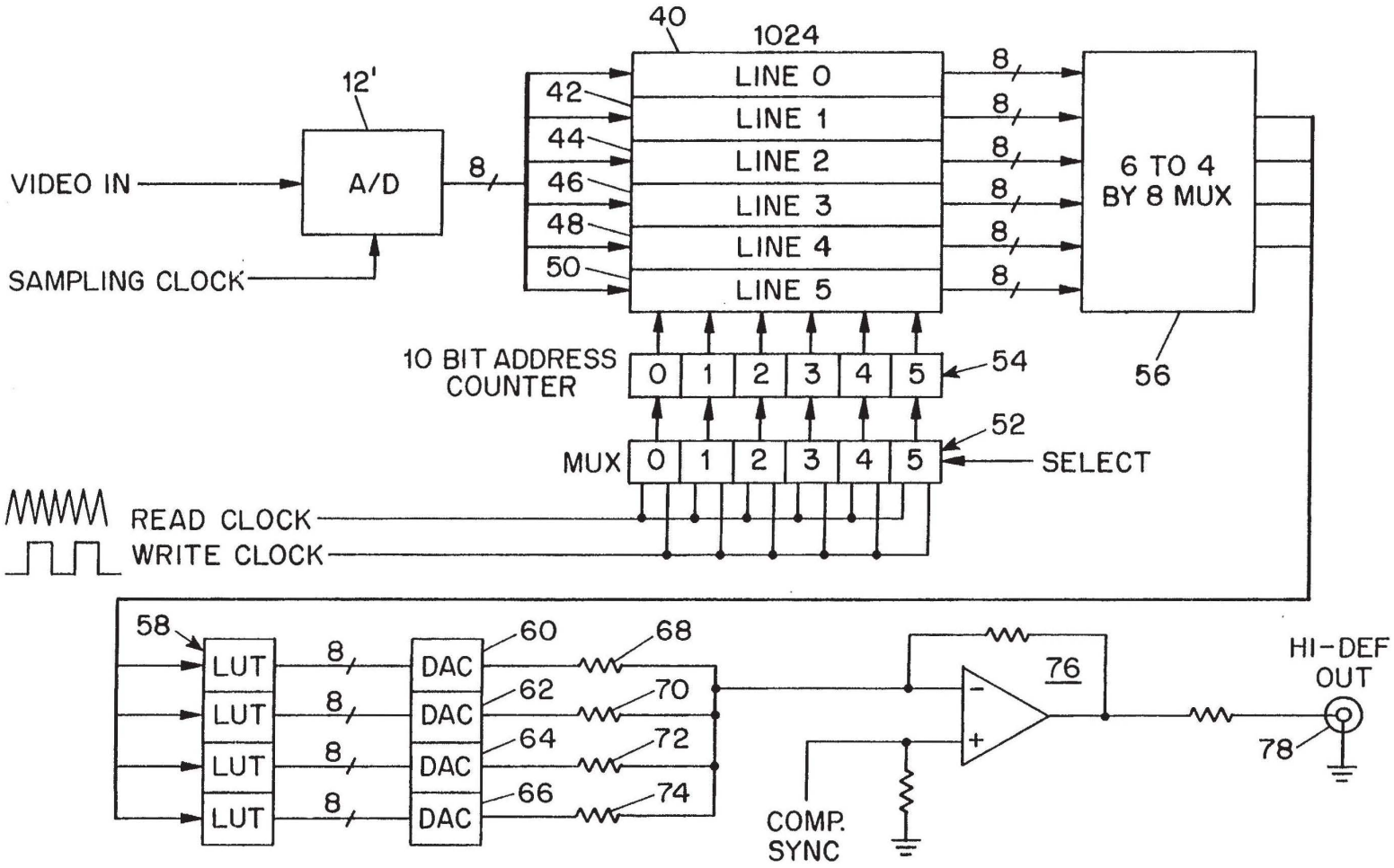

40
1024
12'
42
44
46
48
50
LINE 0
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
8
VIDEO IN
A/D
SAMPLING CLOCK
6 TO 4
BY 8 MUX
56
10 BIT ADDRESS
COUNTER
0 1 2 3 4 5
54
MUX
52
SELECT
READ CLOCK
WRITE CLOCK
58
LUT
DAC
60
62
64
66
68
70
72
74
76
COMP.
SYNC
HI-DEF
OUT
78

FIG. 2

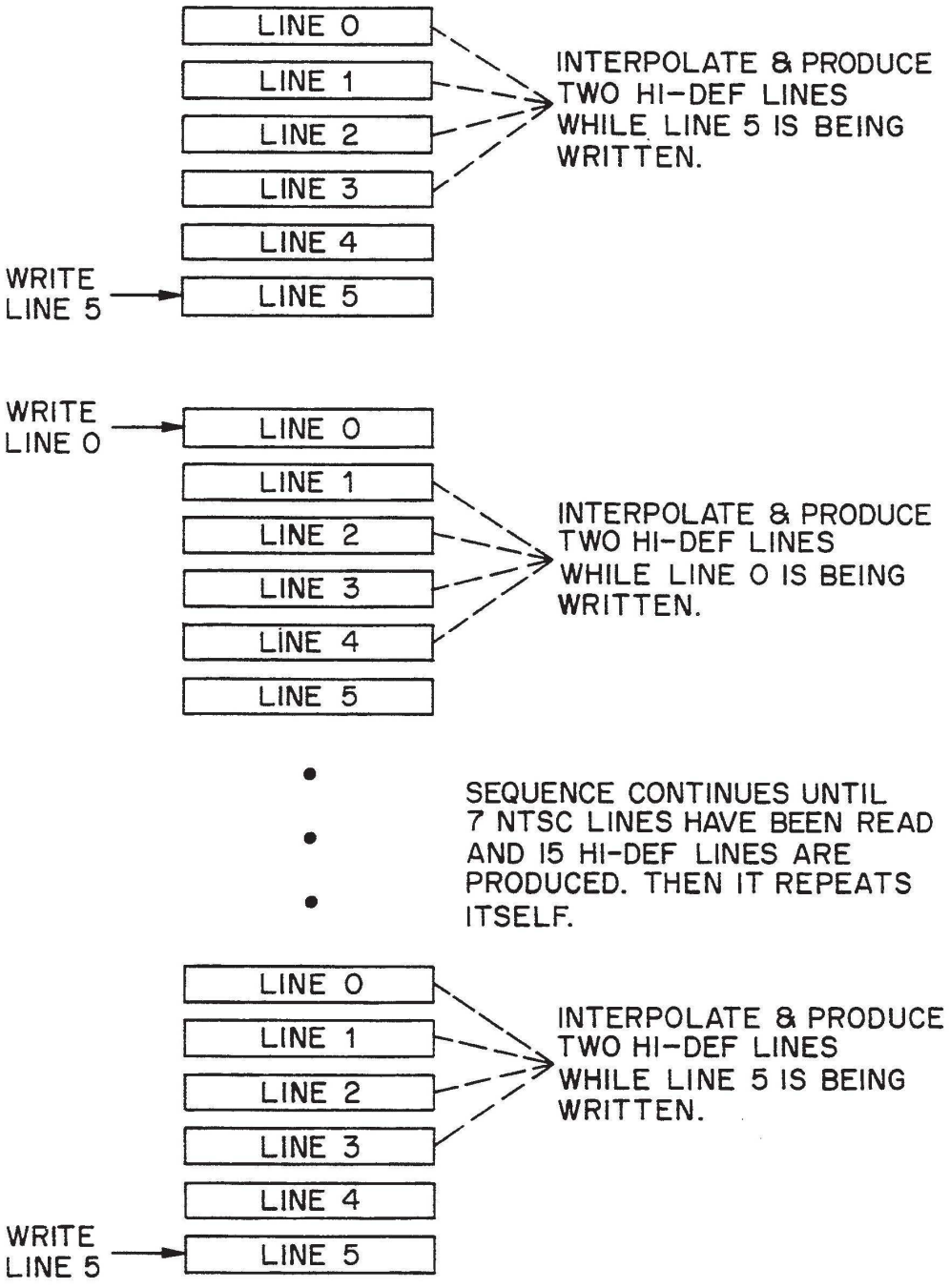

LINE 0
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
INTERPOLATE & PRODUCE TWO HI-DEF LINES WHILE LINE 5 IS BEING WRITTEN.
WRITE LINE 5
WRITE LINE 0
LINE 0
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
INTERPOLATE & PRODUCE TWO HI-DEF LINES WHILE LINE 0 IS BEING WRITTEN.
SEQUENCE CONTINUES UNTIL 7 NTSC LINES HAVE BEEN READ AND 15 HI-DEF LINES ARE PRODUCED. THEN IT REPEATS ITSELF.
LINE 0
LINE 1
LINE 2
LINE 3
LINE 4
LINE 5
INTERPOLATE & PRODUCE TWO HI-DEF LINES WHILE LINE 5 IS BEING WRITTEN.
WRITE LINE 5

FIG. 3

ADAPTIVE SCAN CONVERTER

BACKGROUND OF THE INVENTION

The present invention relates generally to information displays and, more particularly, to apparatus for converting from any of several input scan formats to a fixed output format.

Information displays are rapidly converting from cathode ray tube (CRT) technology to various forms of solid-state driven matrix displays. While CRT's can easily be scanned with various formats simply by changing the vertical and horizontal scan frequencies, matrix displays have a fixed geometrical format. Matrix displays can easily be scanned at different vertical frequencies, but the number of lines in the vertical direction, and the aspect ratio of the image, are both fixed.

As a consequence of the widespread use of computers and many television formats, there is wide range of scan formats ranging from 262 lines to 2,048 lines. Vertical scan frequencies range from 50 to 72 Hz, scan formats are both progressive and interlaced, and aspect ratios vary from 16:9 to 3:4. Accordingly, if one uses a fixed pattern CCD television camera, for example, and wishes to present the video information on a display having a fixed format different from that of the camera, it is necessary to scan convert. While it is fairly easy to operate either the camera or the display at any desired vertical scan rate, such as 59.94 Hz, 60 Hz or 50 Hz., there is a problem should it be necessary to use a different number of lines than the device was made for, be it camera or display, because of their fixed physical pattern.

Interpolation has long been successfully used for scan conversion, and usually involves interpolation between two adjacent lines with the appropriate ratios for the derived output line. An example of such known apparatus is the line-rate converter described in the article entitled "An HDTV Down-Converter for Post-Production", L. Thorpe et al, SMPTE Journal, February 1990, pp 124–135, in which the 525-line rate required at the output is synthesized from the higher 1125-line rate of the HDTV input. The HDN-2000 down-converter described in this article is an intra-field line-rate converter that uses a frame store and a moderately sophisticated interpolation scheme. Breaking the 1125-to-525 conversion ratio down to its simplest form produces the ratio 15:7, indicating that the line interpolation process requires fifteen lines of HDTV video to synthesize seven output lines of 525-line video. Within this structure, the line interpolation process becomes a decision about how many adjacent HDTV input lines will be employed to structure a single output line of video. The hardware implementation of the interpolation consists of a series of one-line delay elements that allow simultaneous access to each of the requisite number of HDTV input lines; the HDN-2000 used four HDTV input lines to construct a given 525 output line, which gives better performance than if only two lines are used for the interpolation routine.

It is known from the article entitled "Signal Processing for Compatible HDTV", W. E. Glenn and K. Glenn, SMPTE Journal, November 1989, pp. 812–816, that interline flicker occurs with interlaced scans due to the residual low spatial frequencies that are displayed with counterphase flicker at the frame rate. Among the circuits discussed for solving the interline flicker problem is the signal processor used in an IDTV receiver in

which 525 lines can be displayed progressively by scan conversion from the 525-line interlaced NTSC transmission. A high-pass digital spatial filter passes information for the top octave of the signal vertically and horizontally, which information is stored in a frame store. The low spatial-frequency information is derived from the current field of the interlaced transmission. High- and low-frequency information is combined and read out progressively at 60 frame per second.

These are but two examples of known scan converters which use a frame store in which the input signal is stored and then taken out at a different line rate by performance of a suitable interpolation routine. Such use of frame stores is premised on the theory that the vertical resolution in a camera is one frame line high and that, therefore, a frame store must be used when converting, say, from an interlaced input to a progressive output. Actually, the vertical resolution in most cameras is two lines high so that there is little, if any, advantage in using a frame store in converting from interlaced to progressive; indeed, the use of a frame store has the disadvantage that some information is delayed by a field behind other information which causes undesirable smear in moving objects, which has to be circumvented with adaptive processing which may include motion detection, all of which adds to the complexity and cost of the scan converter.

A primary object of the present invention is to provide an adaptive scan converter which is relatively simple and sufficiently low in cost to enjoy widespread acceptance.

Another object of the invention is to provide a scan converter having the capability of converting from any of several input scan formats to a fixed output format.

Other objects of the invention are to provide a scan converter which automatically provide the correct aspect ratio; and which provides a progressive display with good motion rendition and good vertical resolution, without interline flicker, regardless of whether the input is interlaced or progressive.

SUMMARY OF THE INVENTION

Briefly, the scan converter according to the invention does not employ a frame store, but instead derives the current displayed field or frame by interpolation from a current input field. The same vertical scan frequency is used for the input and the output, whereby the input and output, even though having a different number of lines, are physically scanning in the same place, vertically, such that only a few lines of storage are needed to accomplish conversion with results at least as good, and in some respects better, than that obtained when the information is derived from a stored frame. Based on the number of lines in the output display, which is read into the converter under external control, the circuit recognizes the number of lines in the input and automatically derives the appropriate interpolation routine to make the conversion to the desired fixed output format.

Other objects, features and advantages of the invention will become apparent, and its construction and operation better understood, from the following detailed description, read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a functional block diagram of a scan converter system constructed in accordance with the invention;

FIG. **2** is a block diagram which illustrates in greater detail the scan converter process of the invention; and

FIG. **3** is a schematic representation of interpolation of a 1125-line output from a 525-line input.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1**, the scan converter according to the invention comprises an input filter section **10** for the three components Y, R-Y and B-Y of an input video signal. The input signal may have any one of several currently used formats including 1125-line interlaced, 1050-line progressive or interlaced, 750-line progressive, or 525-line interlaced. The filtered input signal is then applied to analog-to-digital converters **12**, one for each component, to an interpolator, memory and microcontroller system **14**, and to digital-to-analog converters and video summers **16** for producing three analog output video components in a format different from the input format. A RGB matrix **18** is provided for converting the video components to R, G. B color signals if desired. The system will be described in the context of converting a 525-line interlaced input format at a vertical scan rate of 60 fields/sec. to an 1125-line interlaced output format, which in accordance with an important aspect of the invention also has a vertical scan rate of 60 fields/sec.

The operation of these basic building blocks is synchronized with timing signals produced by a timing generator **20** which, in turn, are locked to the sync pulses of the input by a genlock circuit **22** of known construction including a sync separator **24** for stripping H and V sync pulses from the luminance component of the input signal, a voltage controlled oscillator (VCO) **26** and a phase lock loop **28**. The H and V pulses derived by sync separator **24** are applied to timing generator **20**, along with the output of VCO **28**, and are also applied to a block **30** labeled "Auto Line Number", along with an 1125 line signal produced by an 1125 lines sync generator **32** synchronized to timing generator **20**. Based on a fixed 1125-line output and several different input formats, identified as A, B, C . . . etc., the following interpolation ratios or patterns are obtainable:

$$\frac{1125}{A}, \frac{1125}{B}, \frac{1125}{C} \cdots \frac{1125}{D}$$

These ratios are stored in memory (RAM) embodied in block **30** and compared with the current input to create a match; this match determines the scan conversion routine. Otherwise stated, the function of block **30**, given the number of lines there are to be in the output format, is to recognize the number of lines in the input (525 in the present example) to automatically derive the appropriate interpolator routine to cause interpolator **14** to make the conversion to an 1125 line progressive output format at a 60 fields/sec. vertical scan rate. An external control **34**, a user-controlled switch that determines what output format is to be used, tells the Auto Line Number circuit **30** how many lines the output format is to have which, in turn, affects the interpolation ratio, so that it knows how many horizontal sync pulses it needs to generate for each vertical sync pulse. That the input and output scan frequencies are the same is insured by passing the vertical synch pulses derived from the input signal through block **30**. The vertical sync pulses and the required number of horizontal sync pulses are applied via line **36** to the interpolator **14** in which the desired conversion is performed.

The interpolation process will be understood from the following description of FIG. **2**, which is a detailed block diagram of that portion of the system shown in FIG. **1** required to process one of the three video components, for example, the luminance signal Y. Currently, most color is encoded in component format and clocked at half the rate of luminance; thus, to handle the color components shown in FIG. **1** would require another scan converter identical to the one shown in FIG. **2** into which R-Y and B-Y would be clocked alternately via a suitable multiplexer (not shown) and then clocked out alternately at the output. Staying with the example used in describing FIG. **1**, six successive lines of the analog luminance component of a 525-line interlaced signal at 60 fields/sec., after suitable filtering, are successively applied to an analog-to-digital converter **12'** controlled by a sampling clock derived from a timing generator synchronized with the H and V pulses of the luminance signal, such as the timing generator **20** shown in FIG. **1**. The 8-bit digital output signals of the A/D converter, representing the six successive lines, are successively read into six digital delay elements **40**, **42**, **44**, **46**, **48** and **50**, under control of a write clock synchronized with the vertical line rate and applied to the delay elements via a six-element select switch **52** and a 10-bit address counter **54**. Each of these delay elements, labeled line **0**, line **1**, line **2**, . . . line **5**, respectively, has one horizontal line duration at the 525 line rate. Based on the 525-line input and an 1125-line output the auto line number **30** selects the appropriate interpolation ratio or pattern which, in turn, selects the necessary timing to read and write the memory buffers **40**, **42**, **44**, . . . **46**, **48** and **50**. The relationship between the rate at which the lines are written and the rate at which the lines are read is the aforementioned interpolation ratio or pattern. In the present example, which represents a worst case as respects the required amount of line buffer storage, a ratio or pattern of 2.14 will be selected from memory and as a result lines will be written at 63.55 μsec and read at 29.66 μsec. This means that 2.14 lines at the high definition rate are formed for each NTSC line interval.

The information for the current output field image is derived by interpolation from the current field by synthesizing high definition output lines at the 1125-line rate from a number of adjacent (preceding and following) NTSC lines 0, 1, 2, etc. according to the expression $No = K_1 \cdot \text{line } 0 + K_2 \cdot \text{line } 1 + K_3 \cdot \text{line } 2 + \ldots + K_m \cdot \text{line}_n$, where the factors K are coefficients that determine the specific contributions from each of the NTSC television lines required to formulate the high definition 1125 output line N_o. Under control of a 1125 line read clock (derived from block **30** in FIG. **1**) applied to the one-line memories **40–50** via the multiplexed select switch **52** and address counter **54**, the information stored in an adjacent four of the memories is read out and applied to respective input terminals of a 6-to-4 by 8 multiplexer **56**, while at the same time information is written into one of the remaining two of the one-line memories. Each of the selected current four lines of information, which appear at respective output terminals of MUX56, is fed to a respective look-up table **58** (LUT). The look-

up tables contain the results of the coefficients that are implemented on the time-base-corrected signals. The values of these coefficients determine the weighting or contribution of the line to any high definition line. The four digital output signals from the four LUTS are applied to the inputs of respective digital-to-analog converters **60**, **62**, **64** and **66**, the outputs of which are mathematically summed, with application of the individual coefficients, in a network of video summers represented by resistors **68**, **70**, **72** and **74**. The sum signal produced at the connected output terminals of the network is applied to the inverting terminal of an operational amplifier **76**; a composite sync signal consisting of the 60 fields/sec. vertical sync pulses derived from the input signal by the GENLOCK system **22** and horizontal sync pulses produced by sync generator **32** (FIG. **1**) is applied to the non-inverting input. Each output line produced at output terminal **78** is always physically located, on the display screen, between two input lines and its information is obtained by adding the information from these two lines in the proper proportions, represented by the coefficients alluded to earlier. The sum of the proportions is always equal to one, and the ratio of the proportions is equal to the distance on the screen from the output lines; i.e., if the output line is $\frac{1}{4}$ of the distance from line A to line B of the input, it will take $\frac{3}{4}$ of the signal from line A and $\frac{1}{4}$ of the signal from line B. This principle is followed regardless of whether the fields of either the input or output are interlaced.

FIG. **3** shows schematically how four NTSC input lines are interpolated to produce the 1125-line output format. In the uppermost diagram, lines **0**, **1**, **2** and **3** are being interpolated, to produce two high definition lines, while at the same time line **5** is being written into memory. Next, lines **1** through **4** are interpolated to produce two more high definition lines, while line **0** is being written into memory. The sequence continues until seven NTSC lines have been read out and fifteen high definition lines have been produced, whereupon the sequence is repeated, as indicated in the lower diagram. As each picture element within the output line number is being structured, its time phasing, relative to the input 525-line contributing samples, progressively alters the ratio of the proportions of the contributions from each of the input lines required to formulate the high definition output line.

While only two stored input lines of information are needed at any given instant to produce one output line, the actual implementation requires storage of more than two because of the necessity for clocking the information into one line store at one rate while a previous line is being clocked out of another store at another rate. Generally, line stores cannot be loaded and unloaded at the same time and cannot be clocked at two different rates. Also, since an output line may start in the middle of the time interval of an input line, some additional storage is needed to allow the lines to operate in full line increments (since the input and output are not synchronous). As a consequence of these two factors, it is necessary to provide several line stores even though only two lines of information are really needed.

While the scan converter has been described as converting a 525-line interlaced input to a fixed 1125-line interlaced output format, it is capable of converting any of several different input formats to one of several different output formats, provided, always, that the input and output vertical scan frequencies are the same. For example, if the output is 1125-line progressive at 60 frames/sec., then the inputs that can be handled (in addition to 525-line interlaced already discussed) would be 1125-interlaced, 1050-line progressive or interlaced, or 750-line interlaced—all at 60 fields/sec. vertical scan rate. As another example, if in a European system the desired output format is 1250-line interlaced at 50 FPS, the input could be 625-line at 50 field/sec. In each case, the input signal would have to be converted to component signals (Y, C_W, C_N) before scan converting.

If, for example, the output is 1125-line, 59.94 frames/-sec., progressive, then the output horizontal scan frequency is 67.4325 kHz. If the input were 1050-line, 59.94 frames/sec. progressive, the horizontal scan frequency would be 62.937 KHz.

Since the input to the present scan converter is fixed, its aspect ratio will have to be preserved; consequently, cropping vertically along either side of the image is necessary. However, the image can be shifted to one side or the other in order to leave space for additional information, such as "Picture in a Picture". These options would be at the election of the user.

Although the invention has been described herein with reference to a specific embodiment, many modifications and variations therein will readily occur to those skilled in the art. Accordingly, all such modifications and variations are within the intended scope of the invention as defined by the following claims.

I claim:

1. Scan conversion apparatus for converting an input signal having an input format and a predetermined vertical scan frequency to a selected fixed output format also having said predetermined vertical scan frequency, said apparatus comprising:

(a) means for recognizing the number of lines in said input format;

(b) means responsive to the number of lines recognized in said input format and to the number of lines in said selected fixed output format for automatically deriving an interpolation ratio to make the conversion from said input format to said selected fixed output format; and

(c) interpolation means for deriving by interpolation according to said derived interpolation ratio, a current field or frame having said selected fixed output format from a current field of an input signal having said input format.

2. Scan conversion apparatus for converting an input signal having an input format and a predetermined vertical scan frequency to a selected fixed output format also having said predetermined vertical scan frequency, said apparatus comprising:

(a) means for recognizing the number of lines in said input format and responsively thereto automatically deriving an interpolation ratio to make the conversion to said selected fixed output format; and

(b) interpolation means for deriving by interpolation according to said derived interpolation ratio a current field or frame having said selected fixed output format from a current field of an input signal having said input format, wherein said interpolation means comprises:

line storage means for separately storing at a first rate at least two adjacent lines of information from a current field of said input signal;

means for reading said stored at least two adjacent lines of information from said line storage means at

a second rate determined by said derived interpolation ratio; and

means for summing the information contained in said at least two read out adjacent lines in selected proportions for producing a line of said selected fixed output format.

3. Scan conversion apparatus as defined in claim 2, wherein said means (a) includes:

means for storing a plurality of interpolation ratios which represent the ratios between the number of lines in said selected fixed output format and the number of lines in a corresponding plurality of possible input formats, and

means for comparing the number of lines in a current input signal with said stored interpolation ratios and responsively to a match deriving the required interpolation ratio.

4. Scan conversion apparatus as defined in claim 2, wherein said apparatus further comprises means for converting said input signal to digital form, and wherein said interpolation means (b) comprises:

digital line-storage means for separately storing at a first rate at least two and up to four adjacent lines of information from a current field of said input signal;

means for reading said digitally stored at least two and up to four lines of information from said line storage means at a second rate determined by said derived interpolation ratio;

means for converting to analog form said at least two and up to four read out adjacent lines; and

means for summing the information contained in said analog versions of said at least two and up to four adjacent lines in selected proportions for producing a line of said selected fixed output format.

5. Scan conversion apparatus as defined in claim 4, wherein said means (a) includes:

means for storing a plurality of interpolation ratios which represent the ratios between the number of lines in a given fixed output format and the number of lines in a corresponding plurality of input formats capable of being converted to said given fixed output format, and

means for comparing the number of lines in a current input signal with said stored interpolation ratios and responsively to a match deriving the interpolation required to convert the current input signal to said given output format.

6. Scan conversion apparatus for converting a first signal having a first format and a predetermined vertical scan frequency to a selected second fixed format also having said predetermined vertical scan frequency, said apparatus comprising:

(a) means for recognizing the number of lines in said first format;

(b) means responsive to the number of lines recognized in said first format and to the number of lines in said selected second fixed format for automatically deriving an interpolation ratio required to make the conversion to said selected second fixed format; and

(c) means including interpolation means for deriving by interpolation according to said derived interpolation ratio, a current field or frame having said second fixed format from a current field having said first format.

7. Scan conversion apparatus for converting a first signal having a first format and a predetermined vertical scan frequency to a selected second fixed format also having said predetermined vertical scan frequency, said apparatus comprising:

(a) means for recognizing the number of lines in said first format and responsively thereto automatically deriving an interpolation ratio required to make the conversion to said selected second fixed format; and

(b) means including interpolation means for deriving by interpolation according to said derived interpolation ratio, a current field or frame having said second fixed format from a current field having said first format wherein said means (b) comprises:

line storage means for separately storing at a first rate at least two adjacent lines of information from a current field of said first signal;

means for reading said stored at least two adjacent lines of information from said line storage means at a second rate determined by said derived interpolation ratio; and

means for summing the information contained in said at least two read out adjacent lines in selected proportions for producing a line of said second fixed output format.

8. Scan conversion apparatus as defined in claim 7, wherein said means (a) includes:

means for storing a plurality of interpolation ratios which represent the ratios between the number of lines in said second fixed format and the number of lines in a corresponding plurality of possible first formats, and

means for comparing the number of lines in a current input signal with said stored interpolation ratios and responsively to a match deriving the required interpolation ratio.

9. Scan conversion apparatus as defined in claim 7, wherein said apparatus further comprises means for converting said first signal to digital form, and wherein said means (b) comprises:

digital line-storage means for separately storing at a first rate at least two and up to four adjacent lines of information from a current field of said first signal;

means for reading said digitally stored at least two and up to four lines of information from said line storage means at a second rate determined by said derived interpolation ratio;

means for converting to analog form the information from said at least two and up to four read out adjacent lines; and

means for summing the information contained in said analog versions of said at least two and up to four adjacent lines in selected proportions for producing a line of said second fixed output format.

10. Scan conversion apparatus as defined in claim 9, wherein said means (a) includes:

means for storing a plurality of interpolation ratios which represent the ratios between the number of lines in a given second fixed format and the number of lines in a corresponding plurality of first formats capable of being converted to said given second fixed format, and

means for comparing the number of lines in a current first signal with said stored interpolation ratios and responsively to a match deriving the interpolation required to convert the current first signal to said given second fixed format.

* * * * *

CERTIFICATE OF SERVICE

I, Gregory N. Stillman, hereby certify that on January 13, 2015, the attached document was electronically filed with the Clerk of the Court using CM/ECF which will send notification to the registered attorney(s) of record that the document has been filed and is available for viewing and downloading

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Upon acceptance by the Court of the e-filed document, six paper copies of the Opening Brief for Plaintiff-Appellant will be filed with the Court, within the time provided in the Court's rules.

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CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION, TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS

The undersigned, an attorney, hereby certifies that:

1. This brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B) and Federal Circuit Rule 32(b). This brief contains 7,882 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and Federal Circuit Rule 32(b).

2. This brief complies with the typeface requirements of Federal Rule of Appellate Procedure 32(a)(5) and the type style requirements of Federal Rule of Appellate Procedure 32(a)(6). This brief has been prepared in a proportionally spaced typeface using Microsoft Word in 14-point Times New Roman type style.

January 13, 2015

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